THE VALUE OF SOURCE CREDIBILITY AND TRUST DURING EMERGENCIES AND DISASTERS

A Dissertation

by

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ABSTRACT

Individuals today face many threats and rely on appropriate guidance to protect their person, property, and pets. Response to hazardous events such as natural disasters, disease outbreaks, food safety concerns, terrorism, chemical plant explosions, petroleum spills, and radiological releases requires individuals to quickly seek and process highly scientific information, often with conflicting opinions prior to deciding to act. This chaotic environment makes decision-making a very complex task.

Risk communication represents a subset of communication practice designed to influence individual perception of risk and to inform audiences of potential risks, thereby empowering individuals to make protective action decisions resulting in the mitigation of or minimizing the impact of the risk. To accomplish these feats, those charged with disseminating public information must be part journalist, part anthropologist, part psychologist, part public relations practitioner, part scientist, and part organizational strategist. Early research in the risk disciplines focused on the information itself. Over time, this focus changed to include the channels through which risk messages are delivered and how information is sought and processed. Improving risk communication efforts requires a cross-disciplinary approach integrating research and theory from a psychological paradigm, an emergency and risk management paradigm, a communications paradigm, and a diffusion of innovation paradigm, which provides a conceptual framework to investigate the dimensions of source credibility and trust and how individuals assign these values to the information sources available during a time of

crisis. Using a Q method approach integrating the thick, rich descriptions of qualitative research for context with quantitative factor analysis of the data, each individual participant is recognized as a holistic unique variable. This approach also allows for the discovery of common themes within groups of individuals and how these individuals determine source credibility and trust. Findings from this study lead to the ability to examine trust and the projection of trust by characterizing distinct points of view. Each distinct point of view then realizes important implications for the future of risk communication practice in regards to messages and messengers.

Conclusions from the study demonstrate the importance of honesty/integrity, altruism/benevolence, and salient values to the individual characterization of trust through the emergence of three distinct points of view reflecting each of these characteristics or a combination of the three. Also discovered were four different points of view regarding how trust is projected onto sources of information. These were defined primarily by proximity to the individual (federal/state-level, county-level, community-level) and by perception of self-sacrifice and servanthood. Including context from the exit interview, this study ultimately supports the idea of empathy and expertise as leading components of trust. However, it presents these concepts as much more complex than indicated in previous research. In addition, this study demonstrates the differences in how expertise and empathy, defined individually, are projected onto potential sources of information. The results of this study also contributes to further discussion regarding Q method as a viable technique for investigating and exploring subjective concepts such as trust and trustworthiness and how these are projected on to individuals.

DEDICATION

This dissertation is dedicated in memory of my mother, Dr. Marjorie Anne Trotter Green, and my father, Dr. Don Carroll Green. Their passion for learning was instilled in me from an early age, and without their encouragement and support throughout the years, this project would not have been possible.

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1. INTRODUCTION

Disasters and emergencies create a chaotic environment where important, life-saving information must be disseminated rapidly. When in crisis mode, individuals experience an increased amount of "mental noise" (Covello, 2011a) and only remember approximately 20 percent of the life-saving information they receive (Covello, Minamyer, & Clayton, 2007). Additionally, failure to understand and follow emergency information in a disaster is costly, not only in human life, but also economically. The costs of search and rescue operations for non-disaster events range from $1,100 to $1,650 per person rescued, depending heavily on the resources needed (boats, helicopters, manpower) (Bryant, 2010; Repanshek, 2008; Fagin, 2009). In 2008, nearly 2,000 rescue operations involving multiple resources were conducted in response to Hurricane Ike, and failure to follow evacuation orders increased costs due to poor communication by 2,000% (Dorell, 2008). The long-term negative impact of unsuccessful communication is also documented in the Fukushima nuclear reactor meltdown, where four years later, thousands of affected Japanese citizens still cite significant mistrust for authority after mixed messages caused people to evacuate to contaminated areas (World Nuclear News, 2012).

In addition to the mental noise with which authorities must compete, communicating in this chaotic environment is further complicated by the differing perceptions of source credibility and trust present in an increasingly diverse society (Lindell & Perry, 1991; Mileti & Beck, 1975; Meredith, Eisenman, Rhodes, Ryan, &

Long, 2007; Peguero, 2006; Spence, Lachlan, & Griffin, 2007). Many of the same communication issues after a disaster passes continue to indicate little has been accomplished to improve the public's knowledge and understanding of how to respond to a disaster. In addition, reviews of crisis communication efforts reveal continued confusion in the understanding of risk (Lindell & Perry, 2004). In emergencies, during disasters or in explaining risk to the lay public, the inherent uncertainty of the event or risk is also associated with how individuals perceive the seriousness of the risk, as well as the quality of the information provided (Qin & Brown, 2006; Slovic & Johnson, 1998).

Past research investigated the role crisis communication plays in the development of risk perception, including perceived trust and credibility of the information source (Chess, Hance, & Sandman, 1987; Fischhoff, Lichtenstein, Slovic, Derby & Keeney, 1984; Covello, 1992; Covello, 1993; Covello, 1995; Qin & Brown, 2006; Paton, Smith, Daly, & Johnston, 2008; Locke, 2011; Lundgren & McMakin, 2009; Covello, 2011b). Recommendations from these studies suggest communication efforts need to (a) manage the expectations of outcomes, (b) provide information that helps people realize the differences between uncontrollable causes and controllable or manageable consequences, (c) improve the dialogue between the public and government agencies and scientists regarding risk from environmental hazards, and (d) be supported by empirical evidence (Paton et al., 2008). That is to say risk perception and crisis communication are not just related topics, but inextricably linked to one another, and have a guiding effect on both information-seeking behaviors and the subsequent

diffusion of information among demographically differentiated segments of a community. Providing for the information needs of individuals while considering the social values and norms, ethnicity, socioeconomic status, and education level each person brings to bear on a life-saving decision is always challenging. This is especially difficult for disaster situations, which are often highly uncertain and include complex scientific terminology. For these reasons, understanding how individuals characterize trust and subsequently project that definition on to sources of information becomes central to improving risk and crisis communication efforts.

The specific problem this project investigates is that traditional channels for disaster communication – including mass media and social media platforms – have failed to reach all segments of a population at risk. This is witnessed in not only the costs of rescue operations and the loss of life discussed previously, but also in ongoing conversations within the emergency management community. In spite of this failure, discussions about improving communication during crisis remain focused on message development and reveal the existence of an information gap – a disparity based on demographic segmentation. This is due to the influence from cultural and psychological factors (more specifically, differences in ethnicity, socioeconomic status, education, as well as personal values and beliefs) on information seeking (Eisenman, Cordasco, Asch, Golden, & Glick, 2007; Savoia, Stoto, Biddinger, Campbell, Viswanath, & Koh, 2008; Quinn, 2008). These factors lead to a significant disparity in information diffusion across all segments of the population. While this chaotic communication environment is challenging for emergency managers and communications professionals, delivering

accurate and credible information at the time of a disaster is critical to the empowerment of individuals to make informed decisions regarding their safety (Florig & Fischhoff, 2007).

Approaching crisis communication, risk perception, and information-seeking from this context, there is an apparent need to incorporate cultural and psychometric components within communication strategies that target an individual's level of risk perception and information source preference. Additionally, there is a need to investigate how the presence of informal opinion leaders within the social network influences the persuasive value of crisis information and the resultant information-seeking process. A more targeted approach to crisis communication, which takes into account demographic/cultural variability, as well as the subjectivity inherent in evaluating trust and source credibility, will improve the rapid diffusion of information in a community faced with crisis and will reduce the information disparity in a diverse population.

This study examines the characterization of trust by and the source credibility preferences of individuals to further understand differences and commonalities in whom individuals place trust in times of emergency. This foundational knowledge, based on a holistic view of the individual, will improve crisis information and diffusion and reduce the information disparity among demographically different segments of a community. Specifically, this study addresses: (a) improving the understanding of individual influences on trust in the face of a disaster, (b) identifying information source preferences based on roles (instead of specific, named individuals) assumed in a disaster,

and (c) identifying potential non-authoritative community opinion leaders within the network.

The objectives are as follows:

Objective 1: To examine how the characterization of trust differs among differentiated segments of a community.

Objective 2: To examine how an individual's information source preference differs among differentiated segments of a community.

Objective 3: To examine how the presence or absence of identified informal community opinion leaders within the community differs among demographically differentiated segments of a community.

These central objectives are evaluated using the following strategies:

1. **Evaluate the characterization of trust by individuals.**

This strategy explores how crisis communication strategies to date have not accounted for individual cultural differences in the definition and characterization of trust and trustworthiness and that analysis of the process from a more holistic view of the individual will reveal differences in the subjective characterization of these concepts.

2. **Evaluate how individuals project trust onto potential information sources when faced with a disaster.**

This strategy explores how crisis communication strategies to date have not effectively investigated the projection of trust onto potential information sources. Analysis of the process will provide a deeper understanding of the social connections

that are imperative for determining source credibility and preference and how these may vary due to the holistic nature and inherent subjectivity of the individual.

3. **Evaluate the structure of a social network within a population based on roles.**

This strategy explores how the presence or absence of identified informal opinion leaders who are highly influential within the community structure will be different based on differentiated segments of a community. Analysis will indicate that the identification of these non-authoritative community opinion leaders based on assumed role (pastor, family, neighbor) differs across differentiated segments of a community. This suggests a need for a more targeted strategy for information dissemination and diffusion.

The unique opportunity this project represents is that it is a necessary step forward in understanding individual decision making behavior because it is one of few studies examining components that influence the diffusion of crisis information with an appreciation of the whole individual as the variable under investigation instead of each individual analyzed according to a singular demographic. This project further serves as a foundational study leading to deeper investigation of source credibility and trust. It is also a means to further examine Q Method as a viable means to analyze subjective material such as trust and trustworthiness.

The results of the study have the potential to impact society by fundamentally changing the strategies employed by those responsible for disseminating crisis information, which may increase the number of lives saved during a disaster. This creates a more informed public by: (a) increasing public scientific literacy; (b) increasing

public engagement with science and technology; (c) improving the safety of individuals (especially underserved and at-risk populations) in society; (d) creating a new avenue for future collaboration between academia, the emergency management discipline, and communities; and (e) improving national security by highlighting on whom individuals place trust and credibility for crisis information. The results from the project may be used to generate targeted and more specific communication strategies that will be shared with the community in which the project was implemented and also through peer-reviewed journal publications and conference presentations. After successful defense of this project, the results will be presented to community officials in the form of an executive summary and discussion of the findings presented at a public meeting determined by community officials. The report will also include potential strategies that may be implemented as part of the community's public information plan. These strategies will focus on the use of trusted information networks that minimize traditional information disparities through culturally significant, informal opinion leaders.

2. LITERATURE REVIEW

2.1 Emergency Management and Communications

In the absence of appropriate risk/crisis information, the subsequent information-seeking and social behaviors of affected individuals leads to the proliferation of unclear, confusing, and even contradictory decisions (Wilkinson, 2001; Braun & Niederdeppe, 2001; Griffin, Dunwoody, & Neuwirth, 1999; Tinsley, Dillon, & Cronin, 2012; Casman & Fischhoff, 2008; Covello, 2011b; Sorenson, Shumpert, & Vogt, 2004; Florig, & Fischhoff, 2007). Previous research studies, conducted primarily in the emergency management discipline, investigated the influence of demographic variables such as socioeconomic status, gender, age, education level, and ethnicity, on decision-making behavior (Huang, Lindell, & Prater, 2015; Wachinger, Renn, Begg, & Kuhlicke, 2013; Lindell, 2014). These studies have not determined which of these demographic variables has the strongest significant predictive reliability on information-seeking behavior (Lindell, & Perry, 2012; Terpstra, & Lindell, 2012). Researchers studying past disasters acknowledge the small number of studies investigating these effects more precisely, representing a gap in the literature and an opportunity to expand on previous risk information research (James, Hawkins, & Rowel, 2007; Sprague, LaVallie, Wolf, Jacobsen, Sayson & Buchwald, 2011; Lindell, & Hwang, 2008). Early research in the risk communications and risk perception disciplines focused on the information itself. Over time, this focus changed to include not only information, but also the channels through which risk messages are delivered and how information is sought and processed.

Prior approaches to investigate individual information-seeking behaviors are based on communication and behavioral theories (the psychology discipline) using the more recognized quantitative and qualitative study designs which enable communicators to get very detailed information from the collected data leading to a number of decision-making models (Brandeau, McCoy, Hupert, Holty, & Bravata, 2009; Bandura, 2001; Osimani, 2012; McGough, Frank, Tipton, Tinker & Vaughan, 2005; Martin, Bender, & Raish 2007; Young, Goodie, Hall, & Wu, 2012; Albarracín, Gillette, Earl, Glasman, Durantini, & Ho, 2005). As demonstrated, most risk information research has been conducted within a single discipline, which provides an opportunity to take a multidisciplinary approach.

In further review, the measurement of risk communication effectiveness has leaned heavily on surveys, tabletop exercises, and qualitative data collection methods. The surveys and tabletop exercises used have been validated in their ability to identify existing communication gaps when investigating such disasters as a chemical spill (High, Lovelace, Gansneder, Strack, Callahan, & Benson, 2010), an outbreak of Severe Acute Respiratory Syndrome (SARS) (Sarpy, Warren, Kaplan, Bradley, & Howe, 2005), pandemic influenza (Freimuth, Hilyard, Barge, & Sokler, 2008), toxoplasmosis (Morris, et al., 2012), and other biological threats (Dausey, Buehler, & Lurie, 2007). To better understand how an individual's information-seeking and social behavior affects decision-making, crisis communication specialists have evaluated individual-level factors affecting decisions and risk perceptions. These factors include trust, ethnicity, socioeconomic status, self-efficacy, and cultural norms. Conclusions from these efforts

point not only to the traditional emphasis on embracing new communications tools to reach a diverse public and ensuring that information shared is scientifically accurate, but also to a focus on the reliability and trustworthiness of the message source in a multiethnic society. In fact, even more than demographics, trust has emerged as one of the leading elements affecting crisis decision-making (Meredith, et al., 2007).

2.2 Trust and Trustworthiness

As people make decisions on the credibility and trustworthiness of information sources, they incorporate their salient beliefs, values, and subjective norms of their social belongingness into the decision process (Earle & Cvetovich, 1985; Boholm, 2003; Lindell, 2000; Broussard & Nisbet, 2005; Siegrist, Cvetkovich, & Roth, 2000; Houghton & Yoho, 2005). Multiple approaches and models of crisis communication have incorporated values, beliefs, and more specifically, emotions because of the impact these factors have on an individual's perception, ability to understand crisis information, and the level of trust placed in information sources (Lundgren & McMakin, 2009; Sandman, 1987; Waddell, 1995; Burns & Slovic, 2007; Jin & Pang, 2010; Covello, 2011a).

The variability in perception of source credibility and trust as an effect of population diversity leads to the existence of an information gap based on differences in ethnicity, socioeconomic status, education, and cultural values/beliefs. This gap represents a significant disparity in the diffusion of culturally-defined information across different demographic segments of the population (especially underserved individuals) (Peguero, 2006; Spence, et al., 2011; Veil, et al., 2009; Beacom, & Newman, 2010).

The ability of a person to trust someone or to deem someone trustworthy is influenced by approximately nine factors: altruism/benevolence, honesty/integrity, social networks, past experience with someone, perceived expertise/ability, institutional/organizational accountability, familial ties, salient values similarity, and similar demography (Cook, Hardin, & Levi, 2005; Siegrist, Cvetkovich, & Roth, 2000; Fiske, Cuddy, & Glick, 2006; Colquitt, Scott, & LePine, 2007; Frederiksen, 2012; Dawes, Cresswell, & Cahan, 2004). Each of these represents a component, or characteristic of trust an individual either consciously or subconsciously uses to establish the trustworthiness of another individual. While a singular characteristic may be the primary determinant, trust and trustworthiness could also be determined by a combination of two or more of the factors. These factors may also be subcategorized according to "who (the dimension of relations) is trusted in regard to what (the dimension of objects) and under which circumstances (the dimensions of situations) change the mode and scope of trust" (Frederiksen, 2012, p. 736). Also, what may be taken into account is "how people are differentiated from each other by liking (warmth and trustworthiness) and by respecting (competence and efficiency)" (Fiske, Cuddy and Glick, 2006, p. 77). Combining the findings of the aforementioned studies resulted in the creation of a model of trust and trustworthiness, shown in Figure 1.

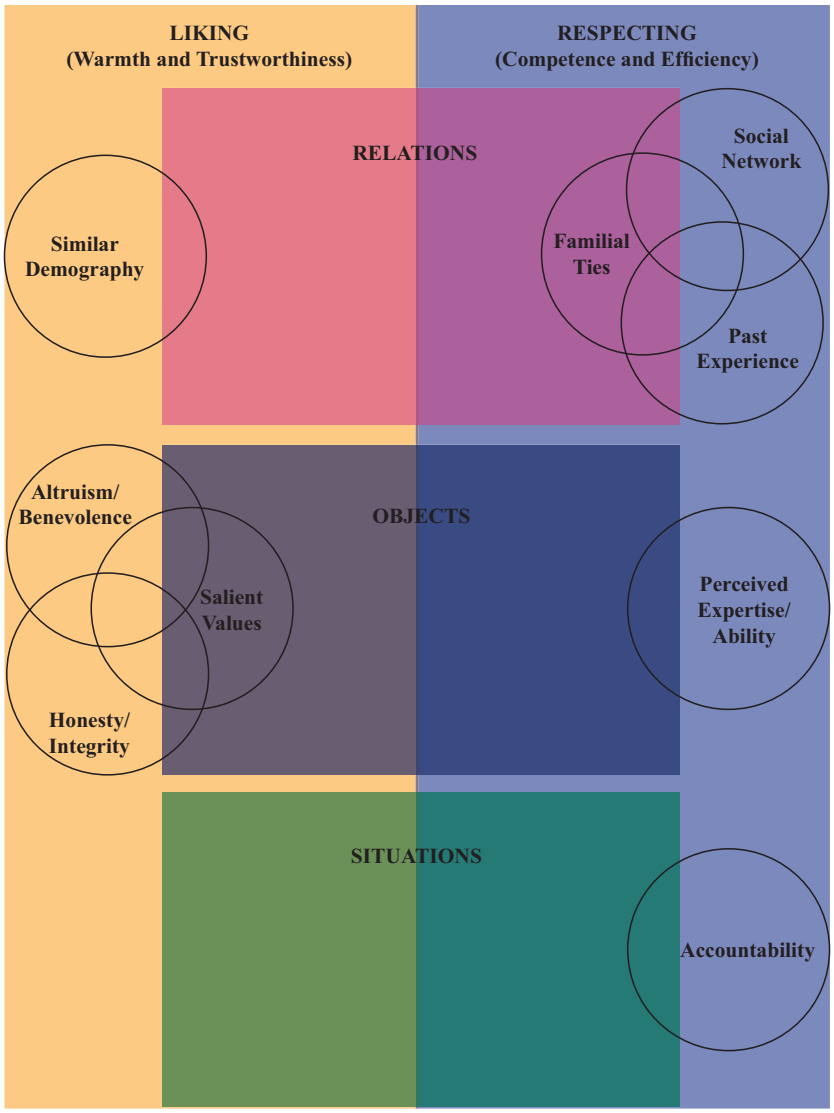

Figure 1
Combined model characterizing trust

In addition to the establishment of source credibility and trust as a factor in decision-making, it is important to note that people are both emotive and inherently judgmental. Slovic (2004) noted that in addition to the importance of analysis, "reliance

on affect and emotion is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world" (p. 973). Moreover, in 2016, Lindell, et al., noted that "disaster researchers mostly have addressed the long-term psychological consequences in the months and years after disasters" with limited attention to the emotions involved in response decision-making (p. 88). It is this initial judgment, which is characterized by affect and emotion, of others that leads to an individual's perception of authority, expertise, and trustworthiness (Fiske, Cuddy, & Glick, 2006; Hertzum, Hans, Andersen & Hansen, 2002; Todorov, Mandisodza, Goren & Hall, 2005; Olivola, & Todorov, 2010). Research has shown individuals are able to make such emotive and affective judgments within a 100-millisecond exposure to someone's appearance whom they have not seen before (Willis & Todorov, 2006; Zebrowitz, Fellous, Mignault, & Andreoletti, 2003; Bar, Neta, & Linz, 2006).

Because the perceived trust and credibility of information provided in a disaster is critical to successfully saving lives, communication strategies in a multiethnic society need to empower people through providing self-protective information and fostering of self-efficacy at an individual level as opposed to a population level. To accomplish this means accounting for cultural differences in relationship to understanding of information, information processing, and establishment of source credibility and trust.

One initial step to bridging the knowledge and information gap is to engage informal community opinion leaders - an important concept emergency managers are encouraged to practice as it may facilitate aggregation of demographic and geographic information about the community they serve. This would allow for the dissemination of

information to segments of the population from sources seen as most relevant and credible to each segment. However, these informal community opinion leaders are often difficult to identify as they serve in non-traditional disaster management roles (pastor, neighbor, family member). Identifying and engaging these informal opinion leaders enables communicators to: (a) better reach potentially vulnerable population segments, (b) address their unique risk information needs and inherent risk perceptions, and (c) better ensure individuals within these groups receive and understand critical information in times of greatest chaos and confusion (Lindell, Prater & Perry, 2007; Valente & Pumpuang, 2007; Sims, Faraj, & Yun, 2009).

To address the information gaps and the perceived difficulty in establishing how individuals determine which source is credible and who is trustworthy, the cross-disciplinary approach of this study integrates research and theory from a psychological paradigm, an emergency and risk management paradigm, a communications paradigm, and a diffusion of innovation paradigm.

From the psychological paradigm, leading theories of decision making have included: cost-benefit analysis, the theory of reasoned action, and social cognitive theory. Early work in this area arose from an objective actuarial perspective that focused on perception as driven by a cost-benefit weighting process. Contributions from research suggest that there exist additional variables influencing how people perceive risk beyond simple information and cost-benefit analysis. Pioneering work by Paul Slovic, Baruch, Fischhoff, and Sarah Lichtenstein highlighted the complexities in evaluating risk perception and introduced a multivariate analysis of the set of mental processes, or

"heuristics", that each individual uses to provide context to the world around them as it pertains to risk (1982). Each of these theories has made valuable contributions to the often "hidden" process of individual decision-making. However, even those studies incorporating the context of a disaster or hazardous event do not look at information and source credibility. The inclusion of trust in these studies is focused on behaviors such as helping others (Levine, Prosser, Evans, & Reicher, 2005).

From the emergency management paradigm, leading theories have included: the risk information seeking and processing (RISP) model, the disrupted information seeking and processing model (DISP), and the protective action decision model (PADM). Using Likert scales on a survey tool, the RISP model has been effectively used to measure information seeking behaviors and the influence of variables such as information sufficiency (does a person perceive they know enough to deal with a risk), self-efficacy to find the information needed, the trust an individual has for a communication channel, pressures from the social environment to gain information, emotional perceptions or fear of a hazard, and characteristics of the hazard itself (ter Huurne, Griffin, & Gutteling, 2009). The flexibility of the RISP model does allow for inclusion of other variables, but the integrity of the model may no longer hold with these different variables.

There are those that argue that the RISP model is too complicated and does not do an adequate job of measuring important variables. Braun and Niederdeppe suggest a modification to the RISP, the Disruption Information Seeking and Processing (DISP) model (2012).

> "If the goal of modeling RISP is to understand when and why people seek information in response to a hazard, we would do well to recognize that people are likely to seek information not just about the risk itself or how to prevent it. Information seeking equally often involves the pursuit of information that will assist us in maintaining our sense of self in the face of a hazardous environment" (Braun & Niederdeppe, 2012).

To this end, the DISP model provides an early introduction to the psychometrics of information seeking as it incorporates the concept of how an individual re-interprets oneself in the face of a hazard and how he or she will cope with that discontinuity, as well as the type of information an individual will need.

One of the more widely used frameworks for understanding protective action decisions is the Protective Action Decision Model (PADM) developed by Lindell & Perry, which suggests that the decision-making process is a loop where multiple inputs of information inform pre-decisional and perceptive states. The individual then makes decisions based on the informed state, which then is subject to inputs from the situational environment, which then provide feedback to the original sources of information acquisition, completing the loop (1991, 2004, 2012).

From the communications paradigm, contributions include: consumer processing theory, as well as outcomes from corporate case studies and market research. And finally, from the diffusion of innovation paradigm, the major contributions are social network theory, change agency, and opinion leadership (Rogers, E. M., 2003). These theories suggest when individuals in a group receive risk information and begin the vetting process within the social network, opinion and perception move toward conformity within the group, and there is a tendency to follow those seen as leaders, who may or may not be like the individuals themselves. This occurs as individuals begin to

engage in deliberation and informal discussion networks, or "social milling" (McLeod, et al, 1999).

It is difficult to create a simple theoretical foundation or conceptual framework for a multidisciplinary study. However, in reviewing the literature, examples of prominent theories were able to be distilled into defining concepts. Each of these concepts and its related theories connect to each other via one of the research foci of Social Influence, Message Source/Channel Preference, Demographic Influence, or Behavioral Response. Ultimately, the concepts directly define an individual as a variable who must be examined holistically by a non-traditional mixed method such as Q method. The graphic below represents how each of these paradigmatic foundations provides a conceptual framework by which to investigate the dimensions of source credibility and trust and how individuals assign these values to the information sources available during a time of crisis (see Figure 2).

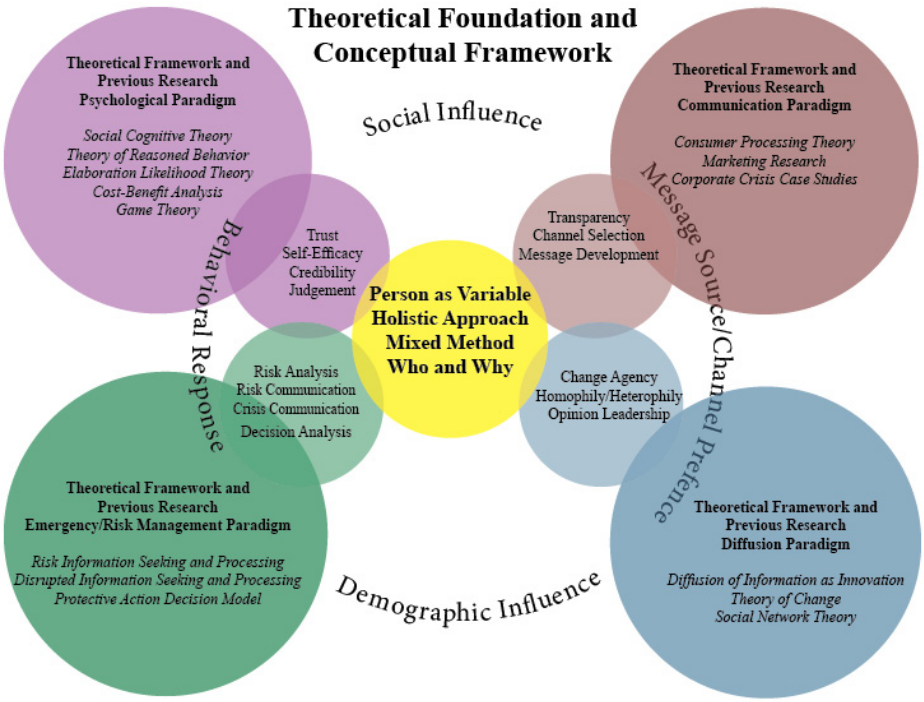

Figure 2
Theoretical foundation and conceptual framework

2.3. Q Method

When it comes to the study of concepts as abstract and subjective as trust and trustworthiness traditional research methods tend to fall short. Qualitative methods are often criticized for their lack of replicability, reliability, and inherent biases (Kamal, Kocor, Grodzinska-Jurczak, 2014), while quantitative researchers find many of their measurement tools "restrict the opinions of the participants into the confines of the conceptual framework of the investigators who designed them" (Barbosa, Willoughby, Rosenberg, & Mrtek, 1998, p. 1032). This suggests an ongoing struggle to find a

quantitative test that will accurately measure the variable subjectivity of attitudes, emotions, and beliefs.

Developed by William Stephenson, a psychologist and physicist, in 1935, Q Method is an analytical approach increasing in popularity "as a fundamentally discursive approach that combines a strong qualitative dimension with the powerful quantitative tool of factor analysis" (Davis & Michelle, 2011, p. 563). The method is best explained by Stainton Rogers in saying that compared to traditional correlation analysis "whereby tests are applied to a sample of people, [Q Method instead] applies persons to a 'sample' of statements. It will be the 'persons', or, more accurately, their action upon a sampling of elements which will be correlated and subsequently factored" (1995, p. 179).

In the literature, it is seen that the number of applications of Q method to research inquiry is growing and has expanded beyond the purely psychometric arena in which Stephenson first developed it. Q Method is now being used in studies of feelings such as love (Watts & Stenner, 2014), student study behaviors (Godor, 2016), human resources and employee satisfaction (Chinnis, Summers, Doerr, Paulson, & Davis, 2001), health education and health promotion (Cross, 2005), individual beliefs and opinions (Overland, Thorsen, & Storksen, 2012), and environmental science (Kamal, Kocor, Grodzinska-Jurczak, 2014), and applied communications (Leggette & Redwine, 2016). It has also found acceptance in the risk analysis community as risk researchers are using Q method to gauge and measure opinions and beliefs about risk from a very different perspective (Venables, Pidgeon, Simmons, Henwood, & Parkhill, 2009).

Relevant to this study, Q Method has been used successfully in an investigation of citizen trust in e-government (Alsaghier, Ford, Nguyen, & Hexel, 2009).

"Q methodology, in its simplest definition, helps quantify human subjectivity in a way that allows for statistical interpretation while leaving the scope for in-depth, qualitative interpretation" (Kamal, Kocor, Grodzinska-Jurczak, 2014, p. 61). This characteristic, the ability to quantify human subjectivity, brings measurement rigor to studies undertaken to examine abstract concepts such as emotions, values, and beliefs. When a qualitative interview is conducted following a participant's sort, as is the case in this study, thick and rich context is included in the interpretation providing a more holistic approach to data analysis.

As McKeown and Thomas said, "The primary purpose of undertaking a Q study is to discern people's perceptions of their world from the vantage point of self-reference" (2013). As this project seeks to determine not only how individuals view the concept of trust (the emotions, values, and beliefs behind the idea of trust and trustworthiness), but also how that concept is projected onto others in an emergency or disaster situation, Q method becomes a valuable, valid approach to data collection and analysis. In addition, with only three recently published studies in the risk discipline using Q method, this study's use of the approach represents an important contribution to both risk and emergency management research and the literature regarding the utility of Q as a statistical method. "When compared to other measurement methods currently employed in the study of attitudes, it can be seen that Q method takes the lead in providing a means of exploring subjective opinion" (Cross, 2005, p. 212). Leggette and Redwine (2016)

posited that studies that bridge a social science, like communication, with an applied context, like agriculture or even risk and crisis management, then Q Method offers a paradigm uniquely suited to provide answers that purely quantitative or purely qualitative approaches simply cannot achieve (2016).

3. MATERIALS AND METHODS

In emergencies and disasters, there are lives lost and people injured, much of which can be attributed to problems of following guidance in a confusing environment. Building on previous research that indicates trust and trustworthiness (defined as empathy and expertise) play a significant role in an individual choosing to follow emergency guidance, this study incorporates the inherent subjectivity individuals bring to the decision of whether or not to trust a source or find it credible. As opposed to previous research that investigated these concepts based on demographics of study participants, this study recognizes individuals and individual behavior are not based on a single demographic quality. Instead, individuals and their behavior include the sum total of their being, a holistic view of person. It recognizes the multiple internal and external influences an individual considers when making decisions and seeking information. This approach provides an opportunity to examine the findings of previous research and develop a deeper understanding of how an individual characterizes trust, how an individual projects that concept onto information sources, and how an individual perceives empathy and expertise.

3.1 Q Method Approach

Q method is a research method increasing in popularity, in particular for studies investigating inherently subjective concepts (Brown, 1993). In a Q study, a sample of statements or items (called the Q set) is drawn from a larger body of information and items regarding a particular topic (the concourse). The concourse and resulting Q set

may be determined through focus groups or a review of relevant literature covering the topic under investigation. The Q set is then presented to and sorted by the selected participants in the study (called the P set) in a rank order "from their point of view, according to some preference, judgement or feeling about them" (van Exel & de Graaf, 2005, p. 1). Through this sorting process, people reveal their subjective viewpoints on a given topic by projecting their subjectivity onto the statements (Smith, 2001).

Due to the subjective nature of Q studies, Q method relies more on the quality of the participant and his/her ability to express a needed viewpoint (van Exel & de Graaf, 2005). As such, Q method studies have a smaller sample than most other studies. Participant numbers between 20-50 are not uncommon. Watts and Stenner (2013) also note that while the lower number of participants often prevents the broad generalizability of the results of a Q study, the small numbers "can still be used to generate very big, and very meaningful, conclusions" (p. 74). As previously stated, the "meaningful conclusions" drawn from a Q study can be used for development of a data collection tool with increased precision due to the information gleaned from this initial study.

Proponents of Q method note "the most important type of reliability for Q is replicability: will the same condition of instruction lead to factors that are schematically reliable – that is, represent similar viewpoints on the topic – across similarly structured yet different Q samples and when administered to different sets of persons" (van Exel & de Graaf, 2005, p. 3). Thomas and Baas, as quoted in van Exel & de Graaf, add "the more common notion of statistical reliability, regarding the ability to generalize sample results to the general population, is of less concern [with Q]. The results of a Q method

study are the distinct subjectivities about a topic that are operant [a part of the given discourse and discussion of any topic], not the percentage of the sample (or the general population) that adheres to any of them" (2005, p. 3).

In support of the smaller number of participants, Stephenson presented Q Method as "an inversion of conventional factor analysis in the sense that it correlates persons instead of tests; whereas previously a large number of people were given a small number or tests, now we give a small number of people a large number of test-items" (1935, p. 18-19). The correlation of people and personal profiles give information about similarities and differences in viewpoint on a particular subject (Brown, 1993). These "clusters" of correlations are described by Stephenson as common viewpoints by which individuals may be measured (1935). In summary of Q Method, van Exel & de Graaf argue that the "premise of Q is that subjectivity is communicable … and can be systematically analyzed. The results of a Q methodological study can be used to describe a population of viewpoints versus a population of people" (2005, p. 2). In explanation and citing Smith (2001), "Q does not need large numbers of subjects as does R, for it can reveal a characteristic independently of the distribution of that characteristic relative to other characteristics" (van Exel & de Graaf, 2005, p. 2).

The first step in a Q method study is to define the concourse from which statements or items representing all relevant concepts to the topic under study are selected. "A concourse is no more or less than the overall population of statements [or photos] from which a final Q set [the items to be sorted] is sampled" (Watts & Stenner, 2013, p. 34). These items are usually statements, but could also include photos or other

items. “The gathered material represents existing opinions and arguments, things lay people, politicians, representative organisations, professionals, [and] scientists have to say about the topic; this is the raw material for a Q” (van Exel & de Graaf, 2005, p. 4). This material may be gathered in multiple ways. From the concourse, the items selected for review and sorting by the participants is called the Q set, and represents a subset of the concourse. The items within the Q set are randomly numbered and printed on cards forming a “deck.”

After defining the concourse and developing the Q set, the participants for the study (the P set) must be selected. This is not accomplished through traditional random sampling methods. “It is a structured sample of respondents who are theoretically relevant to the problem under consideration; for instance, persons who are expected to have a clear and distinct viewpoint regarding the problem. Eventually, the number of persons associated with a factor is of less importance than who they are; in the total population, the prevalence may be much higher” (van Exel & de Graaf, p. 5).

The members of the P set, the participants, are then asked to sort the cards according to guidelines and definitions provided by the investigator. Most sorts use a dichotomous range of values (i.e. most agreeable to least agreeable, most important to least important). Participants are provided a score sheet or guide, which gives them direction on how the cards should be distributed. This distribution may be a forced distribution (leading to a quasi-normal distribution) or some other pre-determined arrangement.

The analysis of Q data is objective, and there are now Q statistical software packages such as PQMethod that run on multiple computer platforms to aid in evaluating the data collected. The level of similarity/agreement or dissimilarity/disagreement among the individual sorts is calculated into a correlation matrix. "This correlation matrix is subject to factor analysis, with the objective to identify the number of natural groupings of Q sorts by virtue of being similar or dissimilar to one another, that is, to examine how many basically different Q sorts are in evidence" (van Exel and de Graaf, 2005, p. 8). Once the factors have been extracted, they are subjected to a process called factor rotation. This process enables the researcher to examine the sphere of opinions from different angles (van Exel & de Graaf, 2005).

The final step of a Q study is to take the final factors and calculate a factor score and a difference score. "Factor scores on a factor's composite Q sort and difference scores point out the salient statements [or objects] that deserve special attention in describing and interpreting that factor" (van Exel & de Graaf, 2005, p. 10).

Across multiple sources, it is recommended that each sort conclude with an exit interview to give the investigator an opportunity to question each participant about the reasoning for the choices he/she made in sorting the items (Brown, 1980; van Exel & de Graaf, 2005; Stephenson, 1935; Watts & Stenner, 2013). At this time, the interviews, with permission from the participant, may be recorded and additional data collected such as personal experience with the topic under study, demographic information, etc. This qualitative conclusion to the study serves to provide thick, rich description of the sorting

process that adds clarity and context to why a participant sorted things in the way he/she did.

3.2 Study Design

3.2.1 Site Location and Population

The population used in this study is Bay City, TX, which is a city with a population of 37,607 located in Matagorda County, approximately two hours from Texas A&M University. This particular community was selected because of the variety of hazards that place the residents at risk. Between 1967 and 2011, Bay City residents experienced 11 hurricane/tropical storm events, three actual or potential wildfires, and five instances of severe flooding (Matagorda County Hazard Mitigation Plan Update, 2015). Bay City is in close proximity to the 10-mile emergency planning zone for the South Texas Nuclear Project (serving as an evacuee receiving community) which places residents at potential risk for a radiological event (STP Nuclear Operating Company, 2014). To accurately assess and be representative of all potential subjective points of view concerning trust and trustworthiness of information and information sources, the selection of the participants was reflective of demographics based on a 2015 report supplied to Matagorda County (where Bay City is located), TX by Applied Geographic Solutions (see Table 1):

Table 1
Study population demographics

	Percentage of Population of Bay City N=37,607
Gender	
Male	50
Female	50
Ethnicity	
White	70
Hispanic (Non-White)	40
African-American	11
Asian/Pacific Islander	2
Other/Mixed Race	15
Household Income	
<$10K - $20K	23
$20,001 - $40K	23
$40,001 - $60K	17
$60,001 - $100,000	15
>$100,001	21
Education Level	
High School or Less	58
Some College	19
Associate Degree	8
Bachelor Degree	12
Graduate/Professional Degree	3

**Note: Data retrieved from http://www.mcedc.net/demogrpahics/ on January 16, 2015. **Note: The percentages for ethnicity total to more than 100%. This is most likely due to some individuals declaring ethnicity as Hispanic and White representing values in both the Hispanic category and the White category.*

In addition, a review of the literature suggested 12 potentially significant points of view relative to trust and source credibility during emergencies and disasters. The 12 points of view are listed in APPENDIX C.

3.2.2 P Set Development Method

The P set was recruited using a purposive network selection process to ensure the appropriate number of participants to reflect all possible views on source credibility and trust during a disaster response. Purposive selection is a strategic process of including or

selecting participants based on their ability to provide a particular viewpoint on a subject (Watts & Stenner, 2013). Potential participants received a recruitment email and a copy of the Informed Consent. A copy of the IRB-approved recruitment email may be found in APPENDIX A and a copy of the IRB-approved Informed Consent Form may be found in APPENDIX B. For the purpose of this study, a target of 30 participants was selected.

Initial entry into the community was made using the researcher's existing relationships with members in the emergency management field. In the process of developing the P set, great care was used to ensure those selected represent one or more of the perspectives from the categories identified in Appendix C. Identified target categories of people included: elected officials, emergency management officials, first responders, non-profit organization employees and volunteers, business owners, teachers, pastors of multiple faiths, and residents who did not fit into one of the categories above. These categories are used because they represent a wide spectrum of the population based on a person's available resources to respond to and understand emergency messaging. It represents a blending of education, socioeconomic status, and ethnicity. In this way, it looks at each individual as a whole versus a sum of demographic parts, and as such, represents the broadest possible number of viewpoints and perspectives.

3.2.3 Study Process and Timeline

As a Q method study, this project consists of two separate sorts of cards (the Q sets) representing statements (each correlating to a characteristic of trust/trustworthiness)

and roles (representing potential sources of information in a disaster) derived from the defined concourse, a fictitious disaster scenario presented in between sorts, and a semi-structured qualitative exit interview.

As mentioned previously, trust and trustworthiness can be characterized by nine different components. Each one, or a combination of two or more) may be more important than others when an individual thinks subjectively about what trust means to him/her. In addition, there are many potential sources of information available to an individual facing a disaster, and which sources are followed and which are disregarded is largely based on perceived source credibility. In a disaster, decisions about the trust and trustworthiness of an information source are based on "thin-slicing" behavior as individuals have to draw on past experiences and patterns of behavior to quickly assess the credibility of the source and information provided. This refers to the ability of our unconscious to find patterns in situations and behavior based on very narrow slices of experience (Gladwell, 2005).

A recent study shows that an exposure as small as 24 seconds (a thin-slice) can lead to remarkably accurate measures of predicted behavior (Wiedmann & Reineking, 2006). In support of this concept, a Public Broadcasting System (PBS) documentary series entitled "RACE – The Power of an Illusion" demonstrated that how people view themselves or others is subjective and does not necessarily follow standard categorization" (PBS California Newsreel, 2006).In other words, how an individual defines or characterizes trust and trustworthiness is a different process than how that

same individual projects those characteristics onto other people, thereby necessitating the two different sorts.

To begin the study, the concourses for both sorts were defined, the Q sets created, and selected individuals invited to participate. Each participant arrived at the Bay City Public Library (1100 7th Street) at a specified date and time or other convenient location such as an office. Each participant received information about the purpose of the study and the nature of his/her participation. According to IRB guidelines, the aforementioned informed consent documents were provided and completed by consenting participants, and each participant received a numerical identifier to aid in protecting his/her confidentiality. The researcher then provided instructions describing the cards and the sorting process.

Before each sort onto the sorting board, the participants sorted the deck provided into three piles: Most Important/Preferred, Neutral, Least Important/Preferred. For each participant, the number of cards in each pile was recorded. At the end of data collection, the average for each pile for the 25 participants was calculated and recorded.

Within each of sort, participants sorted the cards into a forced distribution along a scale according to a "quasi-normal distribution" (so called in that it is a forced-choice distribution based on the assumption from Stephenson that trait measurements would cohere to a normal distribution (1939)), which minimizes duplication at any one specific value and also prohibits participants from putting everything in the neutral pile by making them place a value on the card being sorted (Wright, 2009). This forced distribution was selected "because it represents the most convenient and pragmatic

means of facilitating the item ranking process" (Watts & Stenner, 2013, p. 78). In addition, Watts and Stenner (2013) note,

> "If the participants are likely to be quite unfamiliar with the topic, or if it is especially complex, a steeper distribution is recommended. This allows a less knowledgeable group of participants to place more items near the middle of the distribution in anticipation of their feeling indifferent about a comparatively large number of issues. A steeper distribution also means less decisions and less potential anxiety for such participants" (p. 80).

Because there was little prior knowledge of what to anticipate with participant response to the complexity of the concepts of trust and source credibility, the steeper distribution was chosen.

3.2.3.1. The First Sort – Trust and Trustworthiness

The concourse for the first sort was defined by the literature on trust and trustworthiness. From this part of the literature review, 25 statements representing nine components of trust and trustworthiness form the first Q set. The purpose of this first Q set is to evaluate the relative importance individuals place on these components when characterizing what trust and trustworthiness mean to them. These statements were printed on cards and randomly numbered/coded. The statements used are listed in Appendix D. The values of each column in the initial sort are assigned as follows: -4, -3, -2, -1, 0, 1, 2, 3, 4 (see Figure 3). The scale is defined as -4 Least Important to Trust to 4 Most Important to Trust.

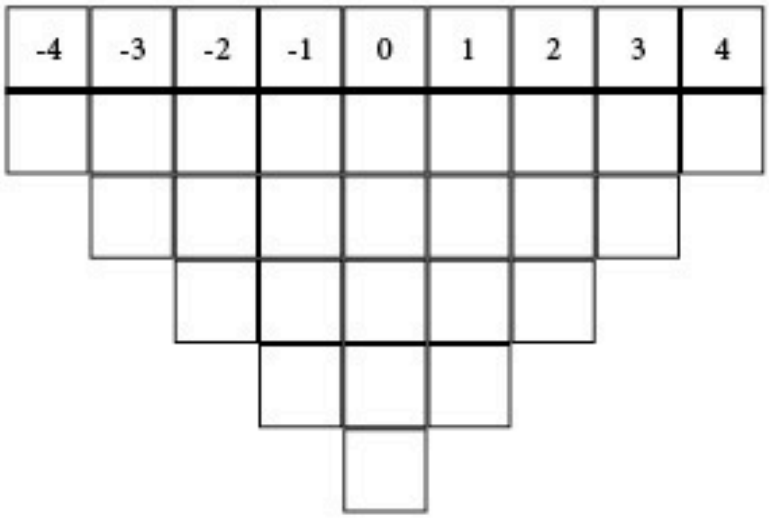

Figure 3
Chart showing forced distribution of 25 items

3.2.3.2 The Hurricane Scenario

After the first sort, participants heard details of an impending disaster. The disaster used for this study is a fictional hurricane named Hurricane Sarge. The decision to use a hurricane scenario is due to the frequency with which Bay City residents are impacted by hurricanes and tropical storms. This familiarity made the sorting process easier for the participants as they did not need to draw on abstract or unfamiliar terms and conditions when sorting the items. The information provided about Hurricane Sarge is drawn from two case studies of hurricanes found in *Managing Crises* (Howitt & Leonard, 2009). The information was presented verbally for each participant from a set script, which may be found in Appendix E.

3.2.3.3. The Second Sort – Roles as Sources of Information

The concourse for the cards was defined from recent publications and case studies in emergency management, which have included mention of specific roles in the context of a disaster (Howitt & Leonard, 2009; Haddow, Bullock, & Coppola, 2008; Lindell, Prater, & Perry, 2007; High, et al., 2010; Jaeger, et al., 2007; Littlefield, et al., 2010). From this, 36 photo cards (similar to sports trading cards) representing different roles that may be sources of information in a disaster form the second Q set. An example of the front and back of one of the cards and the roles included in the deck are listed in Appendix F. This second Q sort evaluates how individuals project the concepts of trust and trustworthiness onto others. as well as a list of the specific roles represented in the deck. While the emergency management literature has not concluded a specific demographic is the primary influence on decision-making in crisis (Sprague, et al., 2010; James, Hawkins, & Rowel, 2007; Lindell & Perry, 2012; Griffin, Dunwoody, & Neuwirth, 1999;Wachinger, Renn, Begg, & Kuhlicke, 2013; Terpstra & Lindell, 2012; Peters, Covello, & McCallum, 1997), the public health and psychology literature point to the success of using ethnically-similar exemplars in the implementation of health behavior change programs (Bandura, 2001; Valente & Pumpuang, 2007; Peguero, 2006; Eisenman, et al, 2007; Brosius & Bathelt, 1994; Wilkin & Ball-Rokeach, 2006; Galarce, et al., 2011; Vaughn & Tinker, 2009). The differences in findings and research approach make this particular demographic (ethnicity) one worth observation, as it has been cited as being relevant to decision making and trust.

As with the first sort, and equipped with the situational information provided from the script, the participants sorted the cards into the three piles – most preferred-neutral-least preferred, and the number in each pile was recorded. The participants then sorted the cards in a forced distribution. Participants were asked which source he/she would most prefer as a source of information down to the least preferred source. The values of each column in this second sort are assigned as follows: -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 (see Figure 4). The scale is defined as -5 Least Preferred to 5 Most Preferred in terms of source credibility/reliability.

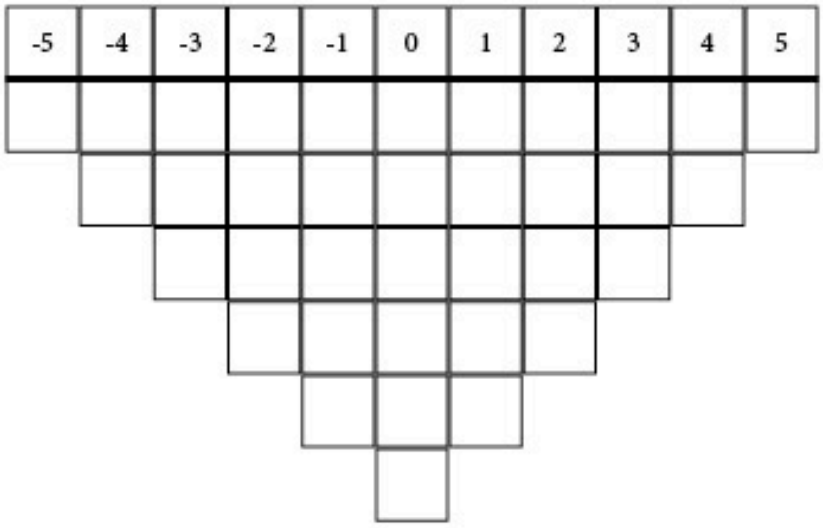

Figure 4
Chart showing forced distribution of 36 items

It will be important to note how the participants sort the cards does not necessarily indicate a particular source is wholly untrustworthy or not preferred, but instead, that source is not preferred in relation to all others from the perspective of the participant.

3.2.3.4 The Qualitative Exit Interview

After both sorts were completed and documented, each participant participated in a qualitative exit interview. The format for the interview used a semi-structured design, which enabled the researcher to ask additional questions arising due to the participant's response. The semi-structured interview format "allows the researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to new ideas on the topic" (Merriam & Tisdell, 2016, p. 110). Watts and Stenner (2013) highlight the importance of this post-sort interview as a means of "increasing the richness and quality of the data" (p. 82) and to explore each participant's wider understanding of the issue, to discover why they have sorted the items as they have and to get them to focus on the meaning and significance of particularly important and salient items" (p.82). In addition, demographic data was collected for each participant to include age, gender, ethnicity, education level, and income range. The interview questions and protocol are included in APPENDIX G. Each participant had the opportunity to comment on the cards, what they thought of the process, or to indicate what other representations should have been included. All data was collected and recorded in a manner that ensures the confidentiality of each participant and will be stored and made available according to the included data management plan.

The timeline for the study is included below in Table 2.

Table 2
Timeline for project implementation and completion

	Aug. 2016	Sept. 2016	Oct. 2016	Nov. 2016	Dec. 2016	Jan. 2017	Feb. 2017	Mar. 2017
Proposal Accepted								
IRB Approval								
Initial Contact			Late October/Early November					
Network/ Participants Selected								
Data Collection								
Data Analysis						January/Early February		
Data Interpretation							February/March	
Results Presented/ Defense								

The data collection process involved ten trips from College Station to Bay City. The earliest trips involved only one or two participants each trip. As familiarity with the community and selected participants increased, the number of sessions scheduled for each trip increased. There was a two-week break in recognition of the Christmas and New Year holidays. The trips provided ample time to focus on the logistics of the day during the drive to the study site, and reflection on the study sessions during the return trip to College Station.

3.3 Statistical Analysis

The results from each individual sort were recorded and entered into the Q statistical software package, PQMethod (acquired as a free download from www.lrz-muenchen.de/~schmolck/qmethod), for analysis. Factors were extracted using principal component analysis (PCA). This type of factor extraction is built into the PQMethod software and is considered to be the a form of factor extraction that "will resolve itself into a single, mathematically *best* solution" (Watts & Stenner, 2013, p. 99). With no prior data to inform the extraction and analytic processes, PCA provides a more straightforward approach to factor extraction. Factors with eigenvalues greater than one, the Kaiser-Guttman criterion, were subject to further consideration based on the researcher's understanding of the data and larger purpose of the Q sort study. Eigenvalues are "indicative of a factor's statistical strength and explanatory power" (Watts & Stenner, 2013, p. 105). Factor load values were calculated, which is an indicator of the extent to which a selected Q sort exemplifies that particular factor.

From there, five factors were initially extracted for the trust sort and seven factors for the role sort. These factors were placed into a correlation matrix and assessed as important or not important through the use of the determined eigenvalues of each factor. In addition, the accepted Q method caveat (also called the 60-40 rule) was applied indicating sorts with one factor loading over .6000 and also loading on all other factors over .4000 should be excluded (Watts & Stenner, 2013). Individual sorts in the first sort were inspected in relation to their loading on the five factors. Those sorts who met the caveat criteria mentioned above were excluded. If there remained only one

defining sort for a factor, the factor was then excluded. This left three factors in the trust sort retained and four factors in the role sort retained for further analysis.

Using a varimax rotation, which represents an orthogonal solution to factor rotation effectively highlighting differences between viewpoints by maximizing variance, the remaining factors were placed on an axis and rotated on their axes within the defined space to "map the relative positions, or viewpoints, of all the Q sorts in the study" (Watts & Stenner, 2013, p. 114). By way of explanation, the geographic or dimensional position of each point (representing a viewpoint expressed in the Q sort and the extracted factors) indicates the level of agreement with the given factor. For example, a Q sort that contains a viewpoint located near the extreme ends of the axes far from the axes' intersection is a viewpoint highly in agreement with that particular factor. Statistically, the varimax rotation "maximizes the amount of study variance explained by the given factors … by-hand [rotation] reserves a key place for the substantive reality – the real world and the real people – that have led, in the first place, to the generation and configuration of a set of Q sorts" (Watts & Stenner, 2013, p. 123). By-hand rotation is an available option within PQMethod; however, it is best used when there is a solid theoretical background for prior knowledge of the subject under study for interpreting the data.

The varimax rotation created new factor loading values after the rotation process. These are called rotated loadings and result in new eigenvalues and, therefore, variances. It is important to note at this point that the power of the viewpoint in relation to the factor remains unchanged (Watts & Stenner, 2013). These new rotated factor values are

used to create weighted scores based on the factor loading, which are then converted to *z* scores. Z scores represent normalized scores that make cross-factor comparison possible (Watts & Stenner, 2013). The *z* scores are then used to create factor arrays for each factor. A factor array "is a single Q sort configured to represent the viewpoint of a particular factor" (Watts & Stenner, 2013, p. 143). These arrays are then interpreted holistically to determine the commonality and disagreement of certain factors, which may mean one trust characteristic in the first sort may emerge as more important than others and one information source in the second sort may emerge as the most commonly sought.

The recordings of the qualitative exit interviews (where permission was given by the participant to record the interview) were transcribed and then evaluated using an open-coding analysis approach. Credibility was established by triangulating the data using interviews, the researchers reflexive journal of observations, and theories discovered during the literature review. Additionally, an audit trail of times, locations, thoughts, and observations for each trip and each participant served to provide reliability of the data. Trustworthiness for the study was defined by the approval of the Texas A&M University Institutional Review Board (IRB) and the use of IRB-approved protocols. In addition, the researcher created an open and transparent environment where each participant was free to question the study and study process.

The transcripts were unitized and the resulting units grouped into meaningful categories or themes using constant comparative method to determine the most relevant groupings of units. Poignant statements that emerged with relevance to the results from

the sorts were then grouped and used to add context and additional meaning to the output from PQMethod. In addition, the researcher took notes in an informal reflexive journal to record thoughts and perceptions of the study process as it occurred and to evaluate the role of the researcher as a human instrument.

4. RESULTS

4.1 Participation

The recruitment process resulted in 25 participants – an 83 percent participation rate in quantitative terms – out of the targeted 30. This was acceptable for this study for two reasons. First, Q method studies typically consist of between 20 and 50 participants, so this number of participants was within the acceptable range for Q method. Second, the Faculty Innovation Center at The University of Texas at Austin published a white paper on participation rates where they indicate for face-to-face data collection, 80-85 percent participation rate is good (2016). It is also noted in the same source that participation rates are less important given the purpose of this study is to gain insight. The demographic breakdown is seen in Table 3. While the demographics are not truly representative of the demographic makeup of Bay City in that the participants skewed higher for household income and for education level. This is likely due to the network selection process.

Table 3
Demographic breakdown of participants

	Percentage of Participants	Percentage of Population
Gender		
Male	60	50
Female	40	50
Ethnicity		
White	80	70
Hispanic (Non-White)	12	40
African-American	8	11
Asian/Pacific Islander	0	2
Other/Mixed Race	0	15
Household Income		
<$20K	8	23
$20,000 - $40,000	8	23
$40,001 - $60,000	8	17
$60,001 - $100,000	14	15
>$100,000	60	21
Education Level		
High School or Less	0	58
Some College	12	19
Associate Degree	16	8
Bachelor Degree	44	12
Graduate/Professional Degree	28	3

However, for Q Method studies, the perspectives and points of view are more important than demographic distribution, and those were representative of what has been defined in the literature and are presented in Table 4.

Table 4
Breakdown of points of view represented

	Number of Participants
Point of View	
Business Owner/Manager	2
Emergency Responder	2
Emergency Management	2
Faith Community/Pastor/Religious	3
Elected Officials	3
Non-profit/NGO/Volunteer	3
Public Health/Healthcare Provider	3
Teachers	2
Residents	5
TOTAL	25

4.2 Trust and Trustworthiness

After the first deck was sorted into the initial three piles, and the cards in each pile counted and recorded, an average of each pile was calculated. (Table 5)

Table 5
Breakdown of trust cards in initial three piles

Category	Number of Cards (n=25)
Most Important	10
Neutral	7
Least Important	8

This means scores from +4 to +1 truly represented the point of view the statements in these positions were important, those at 0 and -1 were truly neutral, and the remainder reflected less importance.

The results from each individual sort for the initial 25 Trust and Trustworthiness statements were entered into PQMethod, and a principle components analysis (PCA) was run. From this, the initial unrotated factor matrix was generated (Table 6). PQMethod automatically extracts eight factors for analysis.

Table 6
Unrotated factor matrix for trust

		FACTORS							
		1	2	3	4	5	6	7	8
	SORTS								
1	P1-1	0.8753	-0.1299	0.1972	0.0186	0.0261	0.0093	0.0005	-0.1182
2	P2-1	0.8551	0.1292	-0.1176	0.29	-0.0796	-0.055	0.2566	-0.1277
3	P3-1	0.8195	-0.0792	-0.3892	0.0193	0.0211	0.0949	0.0522	0.3254
4	P3-2	0.8278	0.2019	0.0898	-0.0976	0.2333	-0.1956	-0.2043	0.2373
5	P4-1	0.8394	0.2566	0.1073	0.2203	0.0496	-0.1638	-0.0588	0.1684
6	P4-2	0.6958	-0.0106	0.189	0.0772	0.6006	-0.0399	0.153	0.0133
7	P4-3	0.6359	0.4208	-0.4289	-0.1638	0.013	0.0262	0.2902	-0.2294
8	P5-1	0.813	0.2915	0.0595	-0.1525	0.1893	-0.1589	-0.2343	-0.1384
9	P5-2	0.8854	-0.1113	0.2389	-0.0609	0.0013	-0.054	0.0026	-0.2603
10	P5-3	0.6143	-0.6087	0.2573	-0.1203	0.1418	0.1206	0.2258	-0.0234
11	P6-1	0.9016	-0.226	0.0859	0.0599	-0.1126	-0.0867	-0.176	0.0051
12	P6-2	0.2106	0.5796	0.5694	0.1295	-0.2583	0.3295	0.2135	0.1798
13	P6-3	0.8112	0.2293	-0.2605	-0.0885	-0.2535	-0.0699	-0.1788	0.0512
14	P6-4	0.8646	0.2932	-0.1168	0.1669	0.1806	0.1058	-0.0843	0.005
15	P7-1	0.8017	-0.2711	-0.2238	0.3432	-0.1554	0.0476	-0.021	-0.0779
16	P7-2	0.9083	0.1703	-0.0902	-0.0407	0.0669	0.0625	0.1572	-0.0047
17	P7-3	0.7992	0.0679	0.3338	-0.3067	-0.2092	0.0571	0.0096	0.0324
18	P8-1	0.8043	0.151	0.2885	0.2684	-0.1853	-0.1761	-0.1333	-0.2091
19	P8-2	0.7102	-0.3242	0.0395	0.3748	0.0158	-0.0188	0.0647	0.1592
20	P8-3	0.8505	-0.2474	-0.2198	0.1425	-0.0371	0.1823	-0.0348	-0.0271
21	P9-1	0.9103	-0.0484	0.1701	-0.1639	-0.0859	0.0944	-0.0339	0.0431
22	P9-2	0.8584	-0.1154	-0.2911	-0.1387	-0.2148	-0.0491	-0.0011	0.0573
23	P9-3	0.7604	0.0236	-0.0636	-0.3181	-0.0678	-0.3365	0.3165	0.1001
24	P9-4	0.7263	0.1353	-0.159	-0.1687	0.1791	0.5191	-0.2061	-0.08
25	P10-1	0.7628	-0.4487	0.1323	-0.2611	-0.1118	0.0565	-0.0738	0.0347
Eigenvalues		15.7666	1.8492	1.4466	0.9634	0.8686	0.7256	0.6406	0.4959
%	expl.Var.	63	7	6	4	3	3	3	2

Factors with eigenvalues over 1.0000 (the Kaiser-Guttman criterion) were retained for further analysis (Factors 1, 2, and 3). Brown suggests that adhering strictly to the Kaiser-Guttman criterion may "lead to meaningful and 'significant factors' (with eigenvalues less than 1.0000) being left behind" (1980). For this reason, Factors 4 and 5 were retained as they had eigenvalues close to 1.0000. The total variance explained by these five factors is 83 percent.

The five factors retained were then subjected to varimax rotation and factor loading. In addition, the weighted average was considered and common to Q Method, the caveat eliminating sorts with a factor loading of greater than .60 on one factor with factor loadings of greater than .40 on one or more other factors was applied and two factors were eliminated. It was determined this left Factor 3 and Factor 5 with only one defining sort each, so these factors were excluded from further analysis. Running the data with Factors 1, 2, and 4 (renumbered as 3) produced the following factor matrix with an 'X' indicating a defining sort. (Table 7) A defining sort is participant sort that is indicative of, or "defines," a particular factor.

Table 7
Factor loadings for trust

	LOADINGS		
QSORT	1	2	3
1 P1-1	0.3225	0.5829	0.4439
2 P2-1	0.5226	0.1855	0.6423
3 P3-1	0.6452**X**	0.2963	0.5218
4 P3-2	0.5378	0.3586	0.2076
5 P4-1	0.4619	0.2101	0.4694
6 P4-2	0.2174	0.3019	0.2477
7 P4-3	0.8626**X**	0.0036	0.1433
8 P5-1	0.6111	0.3241	0.1454
9 P5-2	0.3433	0.6381	0.3794
10 P5-3	-0.0466	0.7900**X**	0.3262
11 P6-1	0.3508	0.6069	0.5694
12 P6-2	0.0461	-0.0139	-0.0468
13 P6-3	0.7711**X**	0.2695	0.367
14 P6-4	0.6292	0.1208	0.4496
15 P7-1	0.3502	0.3232	0.8202**X**
16 P7-2	0.6629**X**	0.3441	0.3708
17 P7-3	0.4265	0.6891**X**	0.1168
18 P8-1	0.2899	0.3346	0.5318
19 P8-2	0.1004	0.3665	0.7273**X**
20 P8-3	0.4492	0.419	0.6607**X**
21 P9-1	0.4688	0.6546	0.3255
22 P9-2	0.6681	0.4915	0.4605
23 P9-3	0.6012**X**	0.5211	0.156
24 P9-4	0.6174**X**	0.2902	0.1865
25 P10-1	0.2528	0.8390**X**	0.3191
% expl. Var.	25	21	19

The cumulative percent variance explained after varimax rotation and excluding two factors is 65 percent. The correlation between factor scores was also determined. (Table 8) The highest correlation between factors was .7069. Correlation between factor scores are a measure of how closely two factors are correlated. The higher correlation between factor scores in this initial sort is due to the similarity in the characteristics of trust defined in the literature review. However, in spite of the higher correlation scores,

there is enough difference to distinguish important nuances that differentiate these factors.

Table 8
Correlation between factor scores

	1	2	3
1	1.0000	0.5624	0.6776
2	0.5624	1.0000	0.7069
3	0.6776	0.7069	1.0000

Factor arrays containing z-scores were computed by PQMethod, and then factor Q-Sort values for the 25 statements sorted by consensus vs. disagreement are listed in Table 9 (this describes the variance across factor z-scores and represents what statements everyone agrees upon).

Those statements reflecting a consensus that the related characteristic is important to trust and trustworthiness are: 5, 6, 20, 3, 1, 2, 15, 10, and 14. These include honesty and integrity, salient values, accountability, and personal experience. Those statements reflecting a consensus that the related characteristic is not important to trust and trustworthiness are: 9, 16, 18, 22, and 25. These include demography and familial ties. Interestingly, perception of expertise and competence was neutral by consensus.

Table 9
Factor Q-Sort values for statements sorted by consensus vs. disagreement

No.	Statement	Factor Arrays 1	2	3
9	Are close to my age	-3	-3	-3
7	Seek advice opinions of family before others	-1	-1	0
5	History of having done what they say they are going to do	2	1	2
6	Accept financial responsibility for what went wrong	1	1	0
19	Are recognized experts in a particular area	0	0	0
20	Sacrifice their needs for the needs of others	2	2	1
16	Call a family member to solve a problem	-1	-2	-1
18	Are of a similar ethnicity cultural heritage	-2	-4	-3
4	Seek advice opinions of friends before others	0	-1	-2
22	Are from the same organizations I belong to	-1	-2	-1
23	Serve as leaders in the community	1	-1	0
3	Possess the background experience to do what needs doing	3	1	2
1	Act with others best interests at heart	2	4	3
12	Reflect authority by uniform and or title	-2	0	1
21	Have a higher level of education and or experience	1	-1	0
13	Seek advice opinions of coworkers neighbors before others	0	-3	-1
2	Present all the facts	4	2	1
25	Represent the same gender as me	-4	-2	-1
15	Take initiative and assume leadership in problem solving	3	0	2
10	Reflect kindness towards others	0	1	3
14	Have a reputation for trustworthiness	1	3	4
17	Think like me	-2	0	-2
8	Behave the same as me	-3	0	-4
11	Admit to wrongdoing	-1	3	1
24	Possess the same personal values ethics that I do	0	2	-2

Upon further examination of the data, the factors and their defining sorts were characterized as having a high reliability and a low standard error. (Table 10) The more defining sorts included in a factor, the higher the reliability of that factor as a unique factor and the lower the standard error.

Table 10
Factor characteristics

	Factors		
	1	2	3
No. of Defining Variables	6	3	3
Average Rel. Coef.	0.800	0.800	0.800
Composite Reliability	0.960	0.923	0.923
S. E. of Factor z-Scores	0.200	0.277	0.277

As opposed to defining variables or defining sorts, distinguishing statements are those specific statements from the Q set that were sorted uniquely for each factor. Statements that distinguish (or are characteristic of) each factor at the $p<.05$ level of significance were then listed. Those statements that were significant at the $p<.01$ level were indicated with an asterisk. (See Tables 11, 12, and 13)

Table 11
Distinguishing statements for factor 1

No.	Statement	Q-SV	Z-SCR
2	Present all the facts	4	1.85
1	Act with others best interests at heart	2	0.79
21	Have a higher level of education and or experience	1	0.53
14	Have a reputation for trustworthiness	1	0.23*
24	Possess the same personal values ethics that I do	0	-0.02
10	Reflect kindness towards others	0	-0.07
11	Admit to wrongdoing	-1	-0.47*
25	Represent the same gender as me	-4	-2.05*

Distinguishing statements for Factor 1 indicate being presented all the facts, a component of honesty and integrity, as imperative to determining trust or trustworthiness, while gender is significantly not an important characteristic. Altruism

(as reflected by statement 1), Expertise/Ability/Competence (as reflected by statement 21), and Past Experience (as reflected by statement 14) are slightly important in this point of view. Admission of wrongdoing, as a characteristic of Honesty/Integrity, was slightly unimportant with a q-sort value of -1.

Table 12
Distinguishing statements for factor 2

No.	Statement	Q-SV	Z-SCR
24	Possess the same personal values ethics that I do	2	0.73
10	Reflect kindness towards others	1	0.69
15	Take initiative and assume leadership in problem solving	0	0.18*
17	Think like me	0	0.12*
8	Behave the same as me	0	-0.05*
22	Are from the same organizations I belong to	-2	-1.34
13	Seek advice opinions of coworkers neighbors before others	-3	-1.4

Looking at the highest and lowest values, the distinguishing statements for Factor 2 reflect similarity to one's Salient Values and Altruism/Benevolence as important to determining trust, while one's Social Network was relatively unimportant.

Table 13
Distinguishing statements for factor 3

No.	Statement	Q-SV	Z-SCR
10	Reflect kindness towards others	3	1.48
24	Possess the same personal values ethics that I do	-2	-1.21*

For the distinguishing statements for Factor 3, Altruism/Benevolence was the only characteristic imperative to determining trust, while one's Salient Values were relatively unimportant.

Another point of analysis included the consensus statements that do not distinguish between ANY pair of factors. These are those statements that were relatively equally relevant across all factors. (Table 14) This table is somewhat different from Table 9 in that it presents a more precise look at consensus/disagreement. An asterisk indicates there was agreement at a significance level of $p<.05$.

Table 14
Consensus statements

		Factors					
		1		2		3	
No.	Statement	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR
4	Seek advice opinions of friends before others	0	0.02	-1	-0.62	-2	-0.67
5*	History of having done what they say they are going to do	2	0.92	1	0.61	2	0.87
6*	Accept financial responsibility for what went wrong	1	0.62	1	0.48	0	0.28
7*	Seek advice opinions of family before others	-1	-0.14	-1	-0.43	0	-0.28
9*	Are close to my age	-3	-1.43	-3	-1.52	-3	-1.51
16*	Call a family member to solve a problem	-1	-0.41	-2	-0.92	-1	-0.44
18*	Are of a similar ethnicity cultural heritage	-2	-1.05	-4	-1.69	-3	-1.39
19*	Are recognized experts in a particular area	0	0.19	0	0.46	0	0
20*	Sacrifice their needs for the needs of others	2	0.86	2	0.98	1	0.5
22	Are from the same organizations I belong to	-1	-0.66	-2	-1.34	-1	-0.53

These consensus statements reflect the similarities between how the points of view reflected by each factor are represented by having sorted the statements similarly. The strongest consensus between factors is reflected in the negative value of the demographics of age and similar ethnicity.

4.3 Role Cards

After the hurricane scenario script was read to the participants, the second deck was sorted into the initial three piles. The cards in each pile were counted and recorded, and an average of each pile was calculated. (Table 15)

Table 15
Breakdown of role cards in initial three piles

Category	Number of Cards (n=36)
Most Important	12
Neutral	12
Least Important	12

This means scores from +5 to the top two in +1 truly represented the point of view the roles in these positions were most preferred, those at the bottom three of +1, 0 and the top three of -1 were truly neutral, and the remainder reflected the least preferred.

The results from each individual sort of the 36 role cards were entered into PQMethod, and a PCA was run. From this, the initial unrotated factor matrix was generated (Table 16). As with the previous sort, PQMethod automatically extracted eight factors for analysis.

Table 16
Unrotated factor matrix for roles

		FACTORS							
	SORTS	1	2	3	4	5	6	7	8
1	P1-1	0.836	0.1217	-0.2085	-0.1136	-0.0226	-0.0897	0.1329	-0.1742
2	P2-1	0.3622	0.537	0.3992	-0.2429	-0.1976	0.262	-0.1512	0.1815
3	P3-1	0.8742	-0.1362	-0.0481	0.0247	-0.1544	-0.1867	0.0271	-0.2714
4	P3-2	0.6796	-0.5788	0.1359	-0.181	0.1255	0.0357	-0.0384	0.0872
5	P4-1	0.756	0.1706	0.2388	0.1687	-0.0339	-0.3543	0.0508	-0.1319
6	P4-2	0.5986	-0.2244	0.1972	-0.0729	-0.2923	0.3926	0.2412	0.1877
7	P4-3	0.557	0.3086	-0.402	-0.1768	0.1574	-0.0241	0.0694	-0.236
8	P5-1	0.7535	-0.4263	0.0023	0.0816	-0.2539	-0.0103	-0.2443	0.1907
9	P5-2	0.6835	-0.6286	0.0784	-0.0121	0.009	-0.0921	-0.0429	-0.0057
10	P5-3	0.1753	0.7138	-0.115	-0.3809	0.3109	0.1136	0.072	0.0248
11	P6-1	0.6664	0.1542	0.2083	-0.3984	0.3854	-0.2059	-0.2179	-0.0242
12	P6-2	0.4261	0.621	0.0732	0.0002	-0.1443	-0.0226	-0.0609	0.4237
13	P6-3	0.7106	0.1474	0.0976	0.2703	-0.0576	-0.1677	-0.4342	0.0285
14	P6-4	0.813	-0.2526	-0.0552	-0.1803	0.1201	0.1457	-0.0943	0.1688
15	P7-1	0.3953	0.4172	-0.2638	0.4323	0.0693	-0.2844	0.3212	0.3147
16	P7-2	0.5891	0.4999	0.3685	-0.1254	-0.0635	-0.0263	0.123	-0.1139
17	P7-3	0.6794	0.1488	-0.5632	-0.0982	0.1847	0.148	0.0675	0.0822
18	P8-1	0.7335	-0.3507	-0.0802	-0.3846	-0.0211	-0.0072	0.0064	0.0795
19	P8-2	0.662	-0.3724	-0.2605	0.1012	0.3259	-0.0178	0.1262	0.0495
20	P8-3	0.6842	-0.0966	0.003	0.037	-0.4262	-0.0426	0.4204	-0.0413
21	P9-1	0.6112	0.2846	0.3618	0.2735	-0.0589	0.1763	-0.1923	-0.368
22	P9-2	0.3404	-0.1334	0.0534	0.5906	0.5038	0.3628	-0.0352	0.0491
23	P9-3	0.501	0.3079	-0.5485	0.2786	-0.2131	-0.0383	-0.2847	0.1109
24	P9-4	0.6598	0.212	0.0605	0.2314	0.0092	0.4106	0.1264	-0.2316
25	P10-1	0.2163	-0.0227	0.785	0.1457	0.3363	-0.212	0.2283	0.1852
Eigenvalues		9.7855	3.369	2.2132	1.5342	1.2858	0.9902	0.9265	0.8666
%	expl.Var.	39	13	9	6	5	4	4	3

Factors with eigenvalues over 1.000 (the Kaiser-Guttman criterion) were retained for further analysis (Factors 1, 2, 3, 4, and 5). As with the previous sort, factors with eigenvalues close to 1.0000 were still considered. For this reason, Factors 6 and 7 were retained. The total variance explained by these seven factors is 80 percent.

The seven factors retained were then subjected to varimax rotation and factor loading, the weighted average was considered, and the 60-40 caveat was applied. This eliminated sorts with a factor loading of greater than .60 on one factor with factor

loadings of greater than .40 on one or more other factors. It was determined that this left Factors 4, 5, and 7 with only one defining sort each, so these factors were excluded from further analysis. Running the data with Factors 1, 2, 3, and 6 (renamed 4) produced the following factor matrix with an 'X' indicating a defining sort. (Table 17)

Table 17
Factor loadings for roles

		Loadings			
QSORT		1	2	3	4
1	P1-1	0.5781	0.2638	0.4106	0.4515
2	P2-1	0.0081	0.8305**X**	0.2072	-0.0232
3	P3-1	0.7522**X**	0.2134	0.1061	0.4658
4	P3-2	0.8846**X**	-0.0134	0.0759	-0.105
5	P4-1	0.4246	0.3544	0.0865	0.5791
6	P4-2	0.6356**X**	0.4729	-0.1146	-0.0933
7	P4-3	0.2468	0.1302	0.6149**X**	0.3712
8	P5-1	0.8421**X**	0.1352	-0.1521	0.2485
9	P5-2	0.8993**X**	-0.0895	-0.0831	0.0727
10	P5-3	-0.2705	0.3655	0.7727**X**	0.058
11	P6-1	0.4317	0.2467	0.6142	0.0981
12	P6-2	-0.0487	0.5860**X**	0.2707	0.4127
13	P6-3	0.389	0.3296	0.0475	0.5614
14	P6-4	0.7855**X**	0.1694	0.3149	0.077
15	P7-1	-0.0581	0.0733	0.1804	0.7758**X**
16	P7-2	0.1592	0.7048**X**	0.2765	0.261
17	P7-3	0.4194	0.0606	0.6156	0.3684
18	P8-1	0.8482**X**	0.0828	0.289	0.0045
19	P8-2	0.6648**X**	-0.2222	0.2572	0.245
20	P8-3	0.6180**X**	0.3476	-0.1097	0.3566
21	P9-1	0.2255	0.6354**X**	-0.0159	0.3072
22	P9-2	0.1475	-0.0151	-0.0065	0.1377
23	P9-3	0.161	0.1313	0.1915	0.7065**X**
24	P9-4	0.3108	0.5372	0.1392	0.2475
25	P10-1	0.0903	0.2308	-0.1158	-0.0387
% exp Var.		27	13	10	13

The percent variance explained after varimax rotation and excluding three factors is 63 percent. The correlation between factor scores was also determined. (Table 18) The highest correlation between factors was .3588. This indicates a very low correlation among factors, which indicates they are specifically differentiated from one another.

Table 18
Correlation between factor scores

	1	2	3	4
1	1	0.2228	-0.0113	0.1868
2	0.2228	1	0.47	0.311
3	-0.0113	0.47	1	0.3588
4	0.1868	0.311	0.3588	1

Factor arrays containing z-scores were computed by PQMethod, and then factor Q-Sort values for the 36 roles sorted by consensus vs. disagreement were listed (this describes the variance across factor z-scores). (Table 19)

Table 19
Factor Q-sort values for roles sorted by consensus vs. disagreement

		Factor Arrays			
No.	Statement	1	2	3	4
6	State Trooper	1	3	2	2
4	Police Officer	1	3	1	1
25	University Researcher	-2	0	-3	-1
13	Mayor	2	2	0	0
3	County Emergency Manager	4	4	5	3
5	County Sheriff	3	4	1	2
16	Director State Emergency Management	5	2	2	2
14	City Council	1	1	-2	-2
22	Local News	0	3	1	-2
1	Firefighter	-1	-2	1	1
27	Government Expert	1	-1	-1	-3
28	Male Neighbor	-5	-1	-1	-2
15	County Judge	4	5	2	3
11	National Guard	1	0	-2	0
2	EMS Paramedic	0	-1	4	1
24	CNN News	0	-2	-4	-3
29	Teacher Neighbor	-4	-1	-1	0
30	Mom Neighbor	-3	0	-1	0
35	Middle Age Family Member	-2	0	0	1
18	Governor	3	0	0	-2
36	Older Family Member	-4	1	0	0
17	Legislator	-1	-4	-1	-5
7	Doctor	-1	-1	3	-1
12	State Guard	2	-2	-3	1
10	United States Army	0	1	-2	4
34	Young Family Member	-3	0	0	2
31	Coworker Direct Report	-2	1	3	-1
21	President	2	-3	-4	-4
19	Federal Emergency Management Agency	3	-2	-3	-2
8	Public Health Practitioner	-1	-3	1	5
32	Coworker Same Level	-3	2	2	-2
33	Coworker Supervisor	-2	2	4	0
23	FOX News	0	1	-5	-4
9	Nurse	-1	-3	3	-3
26	Extension Specialist	0	-4	0	4
20	Department of Homeland Security	2	-5	-3	2

Those roles reflecting a consensus the related role is important as an information source included: 6, 4, 3, 5, 16, and 15. These include law enforcement and local/county emergency management. Those statements reflecting a consensus the related role is not important as an information source are: 25 and 17. These include state elected officials and social network.

Upon further examination of the data, the factors and their defining variables were characterized as having a high reliability and a low standard error. (Table 20)

Table 20
Factor characteristics

	Factors			
	1	2	3	4
No. of Defining Variables	9	4	2	2
Average Rel. Coef.	0.8	0.8	0.8	0.8
Composite Reliability	0.973	0.941	0.889	0.889
S.E. of Factor Z-Scores	0.164	0.243	0.333	0.333

Roles distinguishing (or characteristic of) each factor at the $p<.05$ level of significance were then listed. Those roles that were significant at the $p<.01$ level were indicated with an asterisk. (Tables 21, 22, 23, and 24)

Table 21
Distinguishing roles for factor 1

No.	Statement	Q-SV	Z-SCR
16	Director State Emergency Management	5	1.78
19	Federal Emergency Management Agency	3	1.31*
18	Governor	3	1.24*
21	President	2	0.76*
27	Government Expert	1	0.31
24	CNN News	0	-0.04
9	Nurse	-1	-0.45
33	Coworker Supervisor	-2	-0.97
35	Middle Age Family Member	-2	-1.39*
34	Young Family Member	-3	-1.42*
30	Mom Neighbor	-3	-1.44*
36	Older Family Member	-4	-1.51*
29	Teacher Neighbor	-4	-1.61*
28	Male Neighbor	-5	-1.67*

Looking at the highest and lowest values, the points of view reflected by factor 1 consider state and federal emergency management officials as preferred sources, while family members and neighbors are significantly not preferred sources.

Table 22
Distinguishing roles for factor 2

No.	Statement	Q-SV	Z-SCR
15	County Judge	5	2.39*
1	Firefighter	-2	-0.84*
8	Public Health Practitioner	-3	-1.00*
26	Extension Specialist	-4	-1.71*
20	Department of Homeland Security	-5	-1.92

Looking at the highest and lowest values, the points of view reflected by factor 2 consider the County Judge, a more local/county level source, as the most preferred source of information, Also, Homeland Security is considered as a very unimportant source of information.

Table 23
Distinguishing roles for factor 3

No.	Statement	Q-SV	Z-SCR
33	Coworker Supervisor	4	1.77
2	EMS Paramedic	4	1.44
7	Doctor	3	1.29*
9	Nurse	3	1.29*
31	Coworker Direct Report	3	1.29
10	United States Army	-2	-0.79
11	National Guard	-2	-0.96
20	Department of Homeland Security	-3	-1.1

Looking at the highest and lowest values, the points of view reflected by factor 3 consider community-level sources of information as important. National level, uniformed authority roles were considered least preferred or important sources of information.

Table 24
Distinguishing roles for factor 4

No.	Statement	Q-SV	Z-SCR
8	Public Health Practitioner	5	1.68*
10	United States Army	4	1.40*
26	Extension Specialist	4	1.28*
34	Young Family Member	2	0.94

Looking at the highest and lowest values, the points of view demonstrated by factor 4 reflect deference to both federal uniformed authority and the perception of expertise/education. Also, age in the form of a younger family member, emerged as least important/preferred.

When examining the consensus statements, these are the roles that are similar across all factors. From this we can conclude the County Emergency Manager and State Trooper roles both have a positive score as preferred sources of information in a disaster across all points of view. (Table 25)

Table 25
Consensus roles

		Factors							
		1		2		3		4	
No.	Statement	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR	Q-SV	Z-SCR
3	County Emergency Manager	4	1.67	4	1.93	5	2.26	3	1.16
6	State Trooper	1	0.34	3	1.09	2	1.13	2	1.06
25	University Researcher	-2	-0.49	0	0.06	-3	-0.97	-1	-0.54

4.4 Qualitative Exit Interview

After each participant finished the sorting process, they were asked to participate in an exit interview. One participant, Participant 9-3, opted out of having his interview recorded, but did allow notes to be taken. What follows is an examination of the common themes emerging for the responses to the interview questions.

The most common situation described by the participants as having been characterized by conflicting information is Hurricane Rita and Hurricane Ike. Other

scenarios included wildfires, tornadoes, and chemical spills. The vast majority of the conflicting information experienced dealt with evacuation routes. Multiple participants cited the evacuation during Hurricane Ike where a mandatory evacuation order led to the apparent "desertion" of Bay City, and then nothing happened – no wind, no rain, no flooding. This has led to some skepticism of evacuation orders, even to the point where one participant expressed the government can pass laws and he doesn't have a problem with that level of authority, but the involvement of authorities dictating evacuation routes was problematic. Another source of conflicting information as a commonality was outsiders. This could include news outlets, government officials at the state or national level, or family and friends. The perception is that only those who are/were in Bay City know what is going on, so requests for action from outsiders was not considered as relevant or important information.

> "Sometimes general information is true, but elaborations cause discrepancies. I think government needs to be more positive and truthful. Everyone needs to be upfront and give info that gets everyone on the same page." – Participant 2-1

> "When it comes to family members, everyone has their own opinions and, based on their education level, may listen to news that may not have been vetted." – Participant 3-2

> "The most conflicting information I received was from someone including my family, calling from out of town because they heard something on the news. News makes things seem worse, and no one outside can comprehend unless they are here." – Participant 4-2

> "The most conflicting information came during Hurricane Rita where we routed people onto highways that were supposed to be updated but weren't. Infrastructure wasn't updated and traveling one hour took 18 hours. It was the uncertainty of it all." – Participant 6-4

The type of information reported by participants as most important in a disaster is the magnitude of the risk/impact. For hurricanes, this was a desire to know the path, the category, and the potential for damage. For the chemical spill, it was the identification of what chemical compound was spilled/released. To find this information, the majority of the participants cited official sources such as the County Judge or County Emergency Management Coordinator. This is not surprising given the smaller size of the community of Bay City and its experience with disasters and the level of preparedness training in which Matagorda County has engaged. There was also a noted preference for local news sources over national outlets. Participants also commonly identified social media and the internet as sources of information that were not considered credible nor followed in a disaster. Descriptions of social media characterized it as being full of misinformation and the primary tool outsiders used to gain information on the situation in Bay City, which often led the outsiders to false ideas of what should happen in terms of response.

> "I wanted a better idea of what we were dealing with – the category, which side, where it was going. I chose not to follow social media unless they were sites I know. Social media sends out false information." Participant 7-2

When provided the list of the nine characteristics of trust, the responses almost unilaterally selected Expertise as what matters most when identifying a potential source of information in a disaster scenario. However, in explaining that selection, participants varied in why they preferred expertise. For some, it was about the education, knowledge, or access to useful information. For others, it was about experience with a given situation. This coincided with how the participants defined the concepts of trust or

trustworthiness in that people who are to be trusted are those who are reliable or have experience or knowledge. However, the definition of expertise as it relates to trust or trustworthiness was also highly related to personal experience with someone or someone having a reputation for trustworthiness instead of just being perceived as an expert.

> "My first source of information would be the emergency manager in this community. They are already plugged in and they have experience. I recognize that as being a recognized expert." – Participant 1-1

> "Expertise is what matters most to me. My most preferred source of information is the County Judge. The current one is trustworthy and he has been through this with us." – Participant 9-1

> "For me, the most important to trust is the person has a reputation for trustworthiness. I have seen them behave, and they do what they say they are going to do. They are responsible and accountable. I prefer the County Judge as a source of information because I have personal experience with him." – Participant 8-3

Extending the concepts of trust and trustworthiness, participants were asked what the term "a credible source" meant to them. Participants expressed a high degree of skepticism in the validity of information identified as coming from "a credible source". The majority of participants stated for the information from a credible source to be believable, they needed to know the source, either the name or the place from where the information was acquired. Additionally, participants agreed there was a need to validate information acquired from one source with another source, and they engaged in this validation either frequently or based on the seriousness of the situation.

> " 'Credible' means there are two sides to every story, and the truth is in the middle. I definitely validate what I here, sometimes making two to three calls." – Participant 5-2

> "If someone tells me they have information from a credible source, they would have to tell me the source before I believe the

information. Everyone has a different way of looking at things." – Participant 6-2

"Sources described as credible lead me to validate and have certainty that the information is true. There is just too much fake news these days. I do spend a good amount of time on the internet, so I research the information I receive when I need to." – Participant 6-4

With the emphasis on having personal experience with someone in order to gauge the person's trustworthiness, participants were asked what they immediately noticed about an unknown person entering a room in regards to the person's perceived trustworthiness or likeability. Appearance was an important quality as expressed by countenance, deportment, how the person handled his or herself, confidence in engagement and body language, and somewhat by hygiene/dress.

"I watch to see if they look someone in the eyes, if they have a confident tone, what is their handshake like." – Participant 3-2

"Sometimes it's as simple as the way they dress, the way they present themselves to others." – Participant 6-3

"I observe how they carry themselves. Do they appear engaged in whatever is going on around them?" – Participant 7-3

Participants were then asked to identify any potential informal opinion leaders (as described in Rogers, 2003) in their community and/or social network. Some participants chose to describe attributes that would make someone an opinion leader such as reliability, proximity to and experience with the community (not outsiders or relative newcomers), and confidence. Others presented elected officials, some successful business owners, and pastors as categories of people considered to be opinion leaders.

"I consider my co-worker as an opinion leader. She has a free spirit and is a Godly person. She has a way of putting things in

perspective." - Participant 2-1

> "I think opinion leaders are determined by their status in the community. It's a reputation demonstrated over time where they have cultivated trust and others have noticed them." – Participant 4-1

> "For me, opinion leaders are others who are in or were in positions of authority. My pastor, I have a lot of respect for him. Most of whom I would consider opinion leaders would be elected Officials." – Participant 4-2

Interestingly, with the almost unanimous choice in the interviews of expertise as what matters most to trusting in a source of information, the actual sorts reflected presenting all the facts, acting with others' best interest at heart, taking in initiative and assuming a leadership role, a source is a recognized expert, and a history of doing what they say they are going to do as important components of trust. The reasoning provided during the interview for sorting the cards this way was mostly due to the perceived need to feel like action is being put in capable hands who won't do people wrong. Not only does this appear to come from experience, but also from the idea that it is easier to trust someone who has earned trust. The least important component of trust was any demographic characteristic. The most sorted as least important was "Has a similar ethnicity/cultural heritage as me". Others were "Reflect the same age as me" and "Reflect the same gender as me". Overwhelmingly, it was stated that race, gender, and age had nothing to do with how trustworthy a person was thought to be.

> "Expertise is what matters most. To me this is the experience to do what needs to be done. It's about exposure and applied knowledge. This is so important, and no one can control things like ethnicity."
> – Participant 5-1

> "In emergency, experience and expertise are most important.

> A person needs to have a reputation for trustworthiness, where I have seen them behave, and they do what they say they are going to do. They are responsible and accountable." – Participant 6-3

> "What matters most is expertise. When it comes to trust and trustworthiness, a person must act with others best interest at heart." – Participant 10-1

> "Expertise is most important. It's important that they present all the facts – how much is true and how much isn't. People make bad decisions with bad information." – Participant 9-4

By and large, the most preferred sources of information were local at the community or county level. Some state level sources were sorted at the top. Rarely did national level sources rank very highly. Participants repeatedly noted the preferred source of information would also be highly related to the situation as some roles would have access to needed information for one disaster situation, but not perhaps for others. This would indicate a trust related to situations almost as much as it demonstrates trust related to objects according to the model expressed in the literature review. In discussing the role sorts, it was again noted the distrust and lack of preference for social media and/or the mainstream media. This is also indicated with the sorting of University Researcher at the Least Preferred spot resulting in a consensus "Least Preferred" in the factor analysis. The thinking behind that was attributed to the perception that researchers are "within" a university setting and do not have much connection with disaster response. They are perceived as not having the vital information needed to be useful as a source of information in a disaster.

> "The people responsible for responding to emergencies are the best sources of information because they have information and resources. When you think about neighbors and friends, they may

be getting their information from what they see on social media." – Participant 8-1

"In a disaster, I prefer to get my information from the County Judge because in the State of Texas, that is the lead role in emergency management and information flows into and out of this position. The University Researcher is more detached from the event and from information." – Participant 3-1

"Our Emergency Management Coordinator does the best for this community. My neighbors and friends, they have their own opinions." – Participant 6-1

"The County EMC is my most preferred source. He is family, but he also has a community-wide reputation for trustworthiness. I do not prefer Legislators because you don't know if they always have the best interests of others at heart. With them, it's all about money and government programs." – Participant 7-1

5. DISCUSSION AND CONCLUSIONS

The results from this study reveal three distinct points of view that can be categorized into thematic personas in regards to characterizing trust and trustworthiness. Also, those characteristics are projected onto four "personas" representing the types of roles people prefer to receive information from in a disaster. Emerging from the dynamic interplay between the characteristics of trust and the establishment of credibility in information sources is an apparent relationship between distance from the community and perceived trustworthiness of individuals and credibility of sources. In addition, insight into the socio-political landscape in the community and into the value of social media and social networks provided additional context to the results.

5.1 Trust and Trustworthiness

Using the existing model of trust as a guide, the findings from the trust sort define three specific points of view. All three identified factors place some amount of importance on Altruism/Benevolence as a defining characteristic. However, one factor combines this with Salient Values, while the other factor combines it with Honesty/Integrity. To better describe how these characteristics define these factors, personas or names were created. Importantly, these factors all fit squarely in the category of Liking, which is more akin to empathy than expertise. Additionally, these are grouped into the dimension of objects, which means these are characteristics emanating from the person to be trusted. Trust is therefore, according to the sorts, not based on relationships or situations. (Figure 5) displays the comprehensive model of trust created and displayed

in the literature review section of this paper, and indicates where the factors fall in the model.

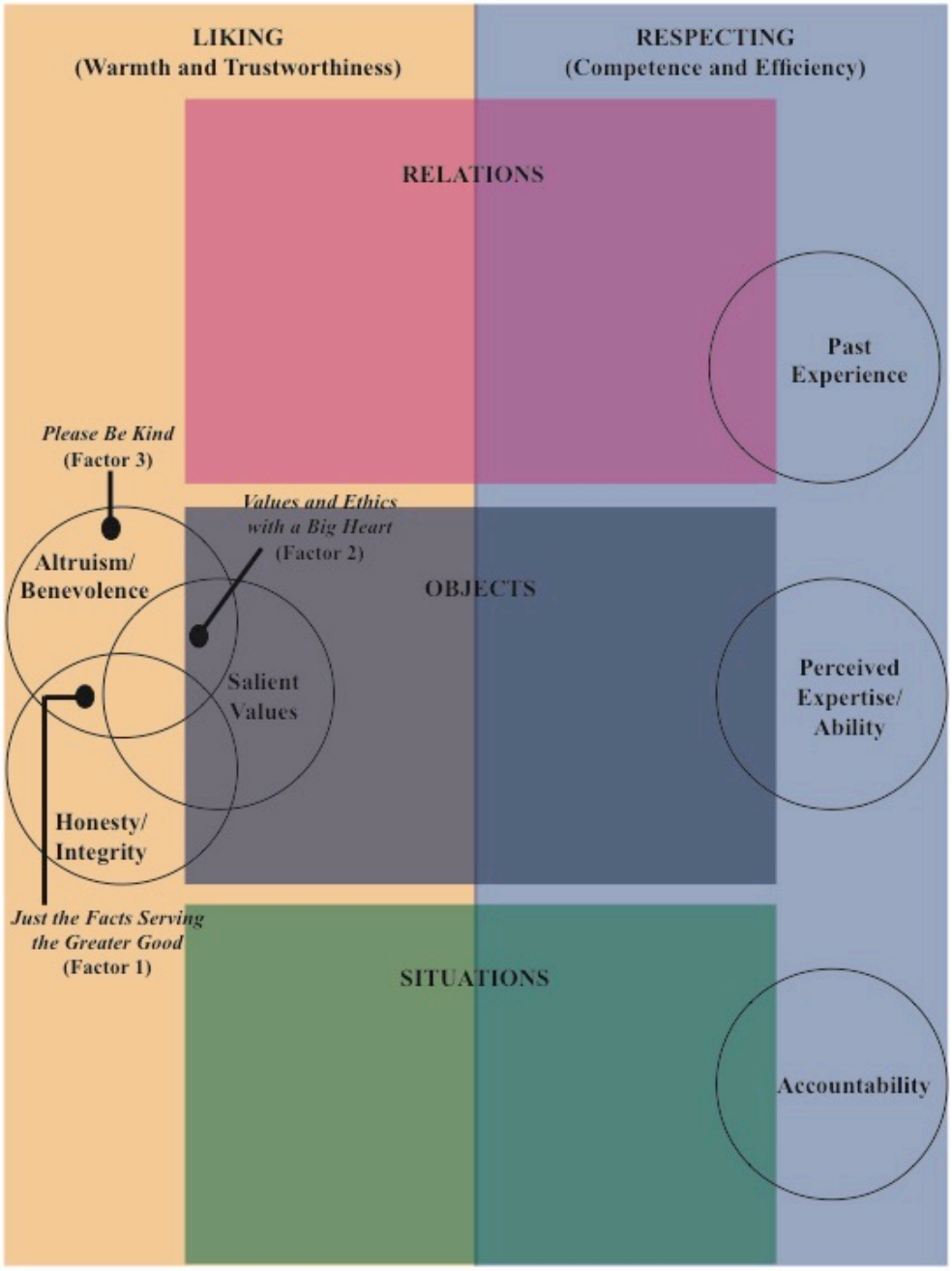

Figure 5
Model with trust factors designated

The first, Factor 1, values Honesty and Integrity and Altruism and can be characterized as “Just The Facts Serving the Greater Good”. Interestingly, the admission of wrongdoing, although a characteristic of Honesty and Integrity, was not considered an important part of how people reflecting this point of view define trust and trustworthiness, neither was Similar Demography based on gender. The implication of this point of view in relation to improved messaging and messengers during a disaster is the need to use language and wording that demonstrate transparency and reflect the complete set of facts as they are known at that time. This should include the pros of the message, the cons of the message, and clearly stating the unknown followed by a description of what is being done to make the unknown known.

The second, Factor 2, is driven by Salient Values and Altruism/Benevolence and can be characterized as “Values and Ethics with a Big Heart”. Social networks were not important. The implication of this point of view in relation to improved communication during a disaster is the perception of similar salient values and kindness implies messages and messengers need to appear empathetic, considerate, compassionate, and should reflect high ethical standards.

The third, Factor 3, is characterized by the singular importance of Kindness, a characteristic of Altruism/Benevolence. As such, this is the “Please Be Kind” point of view. Contrary to the perspective of Kindness reflected in Factor 2, this was the only characteristic of value to this point of view, and Salient Values were significantly unimportant (Figure 7). The implication of this point of view in relation to improved communication during a disaster is the need to appear empathetic and understanding.

Returning to the findings of previous research, the establishment of trust in an information source was paramount to a person choosing to take a protective action in response to a disaster (Meredith, et al., 2007).. Further characterization of trust established empathy and expertise as leading characteristics of trust and trustworthiness. The trust sort confirms empathy as an important trust concept, but it adds an extra layer to empathy by further defining it as "Liking" in relation to "objects", more specifically Altruism and Benevolence as an expression of empathy across all points of view. The perception of Honesty and Integrity and reflection of Salient Values are important additional components for emergency managers to consider. It would be worth the time and effort to meet in focus groups or town hall formats to determine what specific salient values are reflected by the majority of the population, as well as if those may be different to small subsets of the community.

Similar demography based on age or ethnicity, social networks, and familial ties were all determined to be unimportant by consensus across all factors. Past experience in the form of having a history of doing what is said will be done was a consensus important characteristic along with Altruism/Benevolence in the form of self-sacrifice. In regards to similar demography, it was noted that people of any age can be wise or have experience, and multiple participants discussed having worked with people from both genders and established a solid foundation of trust during that time. However, the most poignant comment regarding similar demography highlighted the importance of experience.

> "Experience to do what needs to be done, the exposure to and the ability to apply knowledge is so important to someone

> being deemed trustworthy. This is a very individualized characteristic that people have some control over. No one can control ethnicity or their cultural heritage." – Participant 5-1

Participant 5-1 supports this by noting "there are deceptive people and trustworthy people in all races and ages."

The one finding of this study that seems not to follow with prior studies is the idea of expertise. The recognition of a person as an expert in a particular area was significantly neutral across all points of view determined in this study through the factor analysis of the participant sorts. This was indicated by the participants' sorting behaviors. What that means is the consensus of the study participants feel a person designated as an expert in a given area was neither important nor unimportant as a determinant of a person's trustworthiness. At the same time, the qualitative data from the interviews overwhelmingly indicate expertise is a significant component in determining a person's trustworthiness.

While these may seem to contradict each other, actually they are congruent. The concept and definition of expertise, what makes someone an expert or experienced, is different across individuals. What this study has found is expertise is important as an overarching basis of establishing trust. Expertise, according to the interviews, is reputational, and fall squarely in the Respecting category. However, expertise appears to change dimensions based on the individual defining the term. For some, expertise is in the relations dimension meaning someone has to have personal experience with another to determine expertise. For others, expertise is based on perceived competence or ability (which may be expressed as authority or access to knowledge) and is in the objects

dimension. And finally, for others, expertise is about accountability, which is in the dimension of situations. for some, expertise is reputational and is gained through personal experience. Ultimately, expertise, while important as the body of literature indicates, is not a simple concept. It is one that cannot be strictly defined by role or title or educational background. It is subjectively determined on an individual level based on qualities both internal and external to the trustor and the trustee. The complexity of expertise is summed up with the following statement from Participant 3-2:

> "Our past experience with people and the experience with those dealing with the situation is what helps establish expertise. We live in a small community and everyone knows everyone. You don't have to be the smartest, but deliver what you say you will. This, as part of expertise, encompasses a whole bunch of leadership traits."

What this means for communication is it is worth the time to meet in focus groups or town hall formats to better define the existing salient values within different groups in the community, and which of those are reflected by the majority of the population.

In conclusion, regarding trust and trustworthiness, the primary characteristic of trust is expertise, just as it is seen in the literature. However, expertise has layers that are largely based on one individual's personal experience with and personal knowledge of another. Just as credibility is considered relative to an individual, so is the concept of expertise as it relates to trust. Similarly, empathy, emerges as a complex concept consisting of components of honesty/integrity, altruism/benevolence, and salient values.

5.2 Roles of Information Sources

The examination of information source preference based on roles yielded four distinct points of view that were differentiated either on the level of government/proximity of the source or the community role (community servant). The point of view represented in Factor 1, "Bring on the Government", is a preference for federal and state officials as sources of information. Preferred sources included: the Director of State Emergency Management, the Federal Emergency Management Agency, the Governor, and the President. This is likely due to the perception that these officials are in a position to know or have access to all the facts. The implication for communication for this point of view is during a disaster, messaging and messages should include official and reassuring statements from those at least at the state level. As soon as there is a federal declaration, appropriate messages reflecting the findings of the trust/trustworthiness sort should be provided/reiterated from authoritative roles at the federal level. There must be the appearance of cooperation and "being on the same page."

The second point of view represented by Factor 2, "Trust Starts in Matagorda County", only had one information source preference, and that was the County Judge. It is important to note it was said Matagorda County is one of the most exercised counties in Texas when it comes to preparing for a disaster. The County Judge is the lead emergency manager in all counties in Texas, and this may be what led to the identification of the County Judge as a significantly preferred information source. The Department of Homeland Security, the parent department of the Federal Emergency

Management Agency, was designated as least preferred as an information source. For communication strategy, this means the County Judge must be out front early and often with appropriate messaging for the residents of Matagorda County. Qualitative exit interview data indicate a high degree of respect and support for this role over all other elected officials at any level (federal/state/local).

The third point of view represented by Factor 3, "The People in My Neighborhood", preferred community servants (doctor, nurse, EMS/paramedic) and co-workers as sources of information. Similar to "Trust Starts in Matagorda County", the preference is for a more localized source of information, however, there is a layer of self-sacrifice or altruism in the community servants selected. The identification of Co-Workers (supervisor and direct report) reflects a preference for proximity and access, a much tighter relationship than with county-level sources of information. Interestingly, the least preferred sources by this point of view are those who represent uniformed federal authority/paramilitary groups (United States Army, National Guard, and the Department of Homeland Security). This would characterize this point of view as somewhat anti-establishment. During a disaster, this means messages and messengers need to include local, recognizable people with a reputation for self-sacrifice. Federal UNIFORMED authority should be avoided if possible. This does not include federal representatives in non-uniformed roles.

And finally, the point of view represented by Factor 4, "Educated and Authoritative Means Access" is characterized by a preference for education and authority with Public Health Practitioner, United States Army, and Extension Specialist

all ranking highly as preferred sources of information. This could also be the result of a small town appreciation for the United States military and veterans, as well as public servanthood. In a disaster situation, messages and messengers relevant to this point of view need to reflect a degree of knowledge and authority that implies they have access to facts and the necessary knowledge to lead.

While these four distinct points of view emerged regarding preferred sources of information as a result of the sorting activity, the thinking or reasoning behind the sorts that led to these being defined as distinct points of view is largely based on the concept of access to information and level of concern for the residents of Bay City and Matagorda County. There very much is an undertone of "it's about me and my family and our safety." The reasoning for this is the level of concern the source is perceived to have. Sources at the state/county/local level are perceived to have a greater concern for Matagorda County and Bay City. National level sources are perceived as too far removed as indicated by comments made during the sorting process. This is an inverse relationship where as distance from the community increases, the preference for that source of information decreases. Conversely, the closer in proximity an information source is related to the community, the higher the preference for its information. This can be seen in Figure 6.

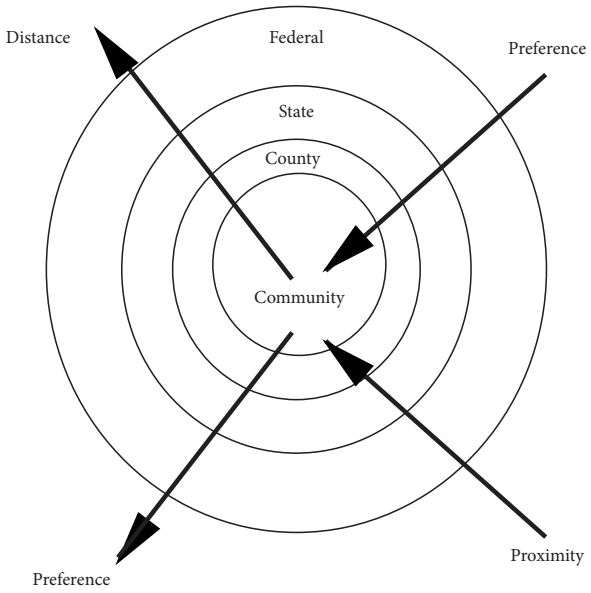

Figure 6
Relationship of distance to source preference

In discussing sources of information during the qualitative exit interview, social media was repeatedly highlighted as unreliable even though it has been encouraged as a valuable information channel for emergency management to use. Official sites and social media profiles were mentioned as sources that could be used, but not one participant mentioned using internet sources or social media as primary sources of information, particularly information that would not have to be validated elsewhere. In sorting the County Emergency Management Coordinator at the top and a Neighbor/Friend at the bottom, Participant 6-1 highlights the negative perception of social media and its perceived influence over others.

> "The County Emergency Management Coordinator does the best for this community. Neighbors and friends, they have their own opinions. They have been watching the news or going

on social media. At the end of the day, it's about who has OUR best interests at heart."

Concurring with Participant 6-1, Participant 6-3 stated,

> "I personally know the County Emergency Management Coordinator. I have personal experience with him, and I like him. Whereas, someone like my supervisor, we have different opinions on things, so I'm less likely to consider that person as a preferred source of information."

Participant 6-4 added, "[Sorting my neighbor/friend as lowest] doesn't mean they aren't wise. I look at what experience do they bring to the table."

5.3 Conclusions

In looking at the roles that were ranked in consensus across all factors, the most preferred role was the Emergency Manager (or EMC). The least preferred was the University Researcher. What we can derive from the consensus roles is the county EMC represents a source of information who is perceived to be highly informed and accessible with the best interests of the community at heart. We also witness the potential disconnect between research/academia and society. The perception is University Researchers are disconnected from the every day operation of the community, particularly in a disaster.

> "[As a researcher, the Extension Specialist] is too far removed. I'm sorry, but human life is more important than animal life." – Participant 2-1

> "University researchers are more detached from what's going on in the community. They are too far removed from the information." – Participant 3-1.

> "My least preferred would be the University Researcher. I don't really know why, but they just don't seem connected. I don't feel a connection." – Participant 8-2

There appears to be a need for academic institutions to better promote research with not only immediate application in society, but also research with a direct impact on making communities and their residents safer and more resilient when disaster strikes. While many would say that research has been done and continues to be in progress, it is not apparent to those who would benefit most from it. Researchers often have the reputation of coming into a community in the aftermath of a disaster, enrolling participants in studies or gathering data, and then disappearing with it. This indicates a clear need for researchers to strongly consider a community-based participatory approach when appropriate.

Another significant influencer when it comes to establishing trust and projecting trust onto sources of information is the growing distrust in federal government, news outlets, and social media. A current example of this is the discourse surrounding "fake news". This presents a conundrum in that it is important for emergency managers to have access to and to use these channels to send out information to populations of people who have limited access to information. This suggests spokespeople need to be closely tied into the community to which they are speaking, they need to be someone who is engaged with multiple groups within the community, and must reflect altruism and benevolence. The high level of understanding how information flows during a disaster suggests people understand if a messenger is "plugged in" to the community, they will inherently have access to the facts. In addition, they are most likely to behave in a way that puts the community's best interests at the forefront and would most likely be

someone who, by personal experience with a number of residents, have an established reputation for trustworthiness.

From this trusted messenger perspective, this highlights the importance of congruent information between all levels of response. It is also an apparent necessity, due to the very individualized determination of expertise, to have multiple sources of information, and not simply a singular source. There is an added opportunity for communities to engage with academic researchers in a joint effort to define best practices for mitigation and recovery for future disasters. Combining the preference for county and community sources of information, a deep regard for public service, and education together, partnerships between community officials and academic researchers can serve as an important bridge in establishing improved disaster response processes and infrastructure enhancements, thereby reducing the cost incurred due to failure to follow protective action guidance.

5.4 Limitations

The process of completing a Q Method project is the potential for bias in the findings. However, Legette & Redwine (2016) note Q method actually limits researcher bias as participants play an active role in becoming a part of the phenomenon, thus providing personal understanding and interpretation to data that is statistically analyzed. As a somewhat qualitative Method, a reflexive journal was kept. Consideration of these results must take into account the role of the researcher as a human instrument, and the influence that may have on the results. It is possible that the presence of the researcher in the room with the participants as they sorted may have had some influence on how the

participants ranked the cards in an effort not to appear "different" or "unusual" to the researcher. Another concern was the photos used to create the role cards. It is quite possible that the age, gender, or ethnicity reflected in the photos may have had an influence on how the participants defined their preference for a particular source of information. For some sorts, the researcher seemed to note groupings by race or perceived "status" of the photos on the cards. This calls into question whether or not the process of sorting is sophisticated or sensitive enough to pick up on nuances of racism and/or elitism.

Another limitation is found in the use of a singular scenario for the project. The one selected was a hurricane as the researcher understood the increased risk of hurricanes present for the community. However, over the course of data collection, it was repeated by multiple participants about the complete evacuation of the city prior to Hurricane Rita. This hurricane took a significant turn to the north, and bypassed Bay City altogether. This has left a residual distrust in evacuation orders within the community, which may have impacted the selection of preferred sources of information. Another theme that became apparent during the course of the study was the somewhat lack of respect for the mayor of the community. It is not that he is wholeheartedly distrusted or disliked, it is simply that overall he is not considered a preferred source of information. The overall political scene in the community may also be driving the response of the participants and influencing the results.

As indicated by the consensus low score of the University Researcher as a source of information, there is a noted distrust and suspicion of research and researchers,

particularly those not from the community where the study was conducted. This could also have potentially influenced how participants responded to the process with all of their choices and interview answers.

Engaging in Q Method research, it is easy for the researcher and participants to develop personal relationships over the course of the study. This can lead to potential influence on the interpretation of the findings by the researcher as one begins to make assumptions about what is "known" about a participant. Again, Leggette & Redwine would suggest the statistical analysis and interpretation of collected data make it this potential influence minimal at best (2016).

Finally, as has been stated earlier in the dissertation, Q Method uses a small number of participants as it is a flipped model with people as the variable under study. The use of only one scenario to guide the sorting of cards, combined with the small number of participants, prevents generalizability to people beyond Bay City and beyond the response to a hurricane. However, the method is particularly robust at identifying subjectivity and its manifestation in distinct points of view. In addition, results from the study can be generalized in terms of points of view, ideas, and phenomena generated from the concourse. This lays the foundation for further examination, further discourse on the subject matter, and development of a more precise instrument by which to further confirm the findings in this study. Ultimately, the strength of this study lies in the work of John Graunt (1620-1674) who has been noted as contributing to the very beginnings of statistical methods of analysis. Graunt, "recognized that the accuracy of mathematical deductions from data must inevitably be limited in one way or another by the adequacy

and precision of the observations themselves. As a result, he was able to show [any] data, if carefully, logically, and honestly interpreted, could be made to yield useful information" (Rosen, 2015, p. 56). This appreciation of statistical analysis underpins not only quantitative, qualitative, and mixed methods, but lies at the very heart of Q Method, and represents exactly what has been investigated by this study.

5.5 Contributions, Recommendations, and Information Sharing

As an applied social science research study, the results and conclusions lead to further contributions to this body of literature and recommendations moving forward. From a methodological point of view, this study has shown to be particularly robust at identifying the operant subjectivity of trust, trustworthiness, and source credibility. It revealed how this subjectivity manifests in distinct points of view, leading to the differing characterizations of "empathy" and "expertise". The study also contributes to building a foundation for further examination using different cards and/or technology. Moving forward, it encourages further discourse on the subjects (trust, trustworthiness, empathy, and expertise) under study and their relationship with the improvement of risk communication strategies. It also potentially leads to a more precise instrument by which to confirm the findings of this study, and for use in future study of this topic. In terms of research recommendations for future studies examining Q method as a research approach, this study lays the foundation for investigating the shared variance between participant points of view using multiple Q sets that share a P set. In addition, it leads to further implementation of this method in other disciplines or contexts.

From a more practical perspective, there are recommendations for practitioners, academics, and researchers. From a risk communication practice perspective, it is shown that engagement with a community to better understand its dynamics and unique perspectives on empathy and expertise is critical to successful communication in a disaster situation. Identifying respected and trusted members of a community is a necessary step in the preparedness phase of planning for an emergency. Practitioners must also understand the benefits and consequences of social media as a channel for disaster information. Ensuring official social media sites reflect faces and facts, as well as that all sites are linked together, increases the congruence and consistency of information and that it is provided by reputable sources. More importantly, it moves communication practice from theory or case-based practice to evidence-based.

For researchers in this field, there are opportunities to expand this study through the use of different scenarios, different communities, different cards, and different technologies. For example, the results may be quite different if a scenario that is not common but is planned for is used. Scenarios of disasters that have immediate versus longer timelines to impact could make a difference. In addition, there are other directions to go in examining empathy and expertise, and the potential development of new models and instruments to use in investigating these subjects further and more precisely. This is the definition of translational research, research that crosses disciplines and integrates knowledge across fields of study.

In recognition that academics are preparing future communicators, future emergency managers, and future professionals in other fields, the recommendation is to

include discussions of subjectivity, perception, trust, and credibility into course learning objectives. It also introduces Q method as a robust research method to be taught to future researchers. This is actually a newer paradigm for classroom teaching in that it focuses attention on appreciating diversity and individuality in society, as opposed to generalizations that often characterize classroom education. It also prepares future practitioners in many fields to understand the dynamics of trust, credibility, empathy, and expertise and how those are influenced by individual, community-level cultures.

In regards to information sharing, it is important to note that the results and conclusions of this study were made possible by the residents of Bay City, TX. The data collected is truly all about them and what they can do to improve emergency communication in their community. Sharing of the findings in this study will go beyond academic publication. Committing to a community-based participatory approach, the findings in this study will be summarized in an Executive Report to include interpretation and recommendations. The report will be presented to the Bay City community in a public forum determined by the Emergency Management Coordinator for Matagorda County. Future endeavors may include continuing this type of study in Bay City, or repeating the study in other communities.

On a final note, the impact of this study and its conclusions is witnessed in the new avenues of discourse and community engagement, the additional thoughts it provides to the body of literature, and in the new pathways revealed for future research endeavors.

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APPENDIX A

RECRUITMENT EMAIL

The email verbiage below is what will be sent to individuals recommended to participate in this study.

Name
Address
Date

Dear [Insert Name]:

Your acquaintance, [Insert Name of Recommender], has provided your name and contact information as someone who could make a valuable contribution to a research study investigating trust and trustworthiness of information sources during a disaster/emergency. [Insert Name of Recommender] may have even contacted you concerning this project prior to your receiving this email. You will be one of only 30 people who will be purposefully selected to provide their points of view as part of this study.

Participation in the study will take place at the Bay City Library, and will be conducted by Angela Clendenin, a doctoral student researcher at Texas A&M University in College Station, TX, and Dr. Tracy Rutherford, her faculty advisor and the principal investigator for the study. It is anticipated that your involvement in the study should you choose to participate will take approximately one hour of your time.

As part of the study, we are interested in how individuals identify and value different components that make up the definition of trust and trustworthiness, and also with whom they most identify as a trustworthy source of information during an emergency or disaster. You will be asked to sort two different sets of cards and to participate in a brief exit interview that will be recorded with your permission.

Attached to this email is an Informed Consent form for your review. It contains information on the study as well as contact information for the research team should you have additional questions. Another copy of this will be provided at the site at the time of your participation should you decide to do so.

If you are willing to support this study through your participation, please respond to this email so the research team is able to provide you with available dates and times so you may select one that is convenient for you.

Thank you for your consideration,
Angela Clendenin

APPENDIX B

INFORMED CONSENT FORM

TEXAS A&M UNIVERSITY HUMAN SUBJECTS PROTECTION PROGRAM

CONSENT FORM

The Value of Source Credibility and Trust During Emergencies and Disasters:

You are invited to take part in a research study being conducted by Angela Clendenin, a researcher from Texas A&M University as part of her graduate student doctoral research project. The information in this form is provided to help you decide whether or not to take part. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefits you normally would have.

Why Is This Study Being Done?
The purpose of this study is to explore the decisions individuals make concerning source credibility and trustworthiness when seeking information during an emergency or disaster situation.

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because we are purposefully selecting participants who represent the broad range of viewpoints on credibility and trust in your community. Through network sampling procedures, you were identified by community leaders as a person with a perspective relevant to the topic of study.

How Many People Will Be Asked To Be In This Study?
Only 30 people (participants) will be invited to participate in this study locally at the one study site indicated in your invitation.

What Are the Alternatives to being in this study?
The alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?
You will be asked to sort two decks of cards. The first will demonstrate what the important components of trust/trustworthiness are to you. Then a description of a fictional disaster will be shared with you. At that time, you will sort a deck of cards with generic photos of potential sources of information you may turn to in response to a disaster. At the end, you will be asked to participate in a brief interview regarding your sorts, what experience you have with disasters, and some basic demographic information. Your participation in this study will last up to one hour and includes this one visit.

You may be removed from the study by the investigator for these reasons:

- You choose not to participate at any point in the process.

Will Photos, Video or Audio Recordings Be Made Of Me during the Study?

The researchers will make an audio recording of the interviews during the study so that your responses to the questions may be reflected accurately in the analysis. These recordings will be made only if you give your permission to do so. Indicate your decision below by initialing in the space provided.

_____ I give my permission for audio recordings to be made of me during my participation in this research study.

_____ I do not give my permission for audio recordings to be made of me during my participation in this research study.

Are There Any Risks To Me?
The things that you will be doing are no greater than risks than you would come across in everyday life.

Although the researchers have tried to avoid risks, you may feel that some questions/procedures that are asked of you will be stressful or upsetting. You do not have to answer anything you do not want to.

Are There Any Benefits To Me? (If there are no direct benefits, this section may be omitted)***
The direct benefit to you by being in this study is the results will be used to define an additional data collection process and then the results of all of the above will be shared with the community to improve communication efforts during emergencies and disasters, which could help participants and their families make more informed decisions when responding to these crisis situations.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?
There is no compensation for participating in this study.

Will Information From This Study Be Kept Private?
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only the researcher, Angela Clendenin, and the Principal Investigator, Dr. Tracy Rutherford, will have access to the records.

Information about you will be stored in locked file cabinet; computer files protected with a password. This consent form will be filed securely in an official area.

People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly.

Information about you and related to this study will be kept confidential to the extent permitted or required by law.

Who may I Contact for More Information?
You may contact the Principal Investigator, Tracy Rutherford, Ph.D., to tell her about a concern or complaint about this research at 979-458-2744 or rutherford@tamu.edu. You may also contact the Protocol Director, Angela Clendenin at 979-436-9499 or clendenin@sph.tamhsc.edu.

For questions about your rights as a research participant; or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office at (979) 458-4067 or irb@tamu.edu.

What if I Change My Mind About Participating?
This research is voluntary and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on you, and your information will be excluded from the study data. Any new information discovered about the research will be provided to you. This information could affect your willingness to continue your participation.

STATEMENT OF CONSENT
I agree to be in this study and know that I am not giving up any legal rights by signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want. A copy of this entire consent form will be given to me.

_____ _____
Participant's Signature Date

_____ _____
Printed Name Date

INVESTIGATOR'S AFFIDAVIT:
Either I have or my agent has carefully explained to the participant the nature of the above project. I hereby certify that to the best of my knowledge the person who signed this consent form was informed of the nature, demands, benefits, and risks involved in his/her participation.

_____ _____
Signature of Presenter Date

_____ _____
Printed Name Date

Thank you.

Tracy Rutherford, Ph. D.

APPENDIX C

THE P SET

Business Owner/Manager

Emergency Responder

Emergency Management

Faith Community/Pastor/Religious

Government Official County

Government Official Local

Non-profit/NGO/Volunteer

Public Health/Healthcare Provider

Teacher

Resident

APPENDIX D

STATEMENTS OF TRUST AND TRUSTWORTHINESS

The statements below were created by the researcher to capture the importance individuals place on the nine factors influencing trust and trustworthiness as mentioned in the Introduction.

1. Act with others' best interests at heart. *Altruism/Benevolence*
2. Present all the facts. *Honesty/Integrity*
3. Possess the background and experience to do what needs to be done. *Expertise/Ability/Competence*
4. Seek advice and opinions of friends before others. *Social Network*
5. History of having done what they say they are going to do. *Past Experience*
6. Accept financial responsibility for fixing what went wrong. *Accountability*
7. Seek advice and opinions of family before others. *Familial Ties*
8. Behave the same as me. *Salient Values*
9. Are close to my age. *Similar Demography*
10. Reflect kindness towards others. *Altruism/Benevolence*
11. Admit to wrongdoing. *Honesty/Integrity*
12. Reflect authority (uniform and/or title). *Expertise/Ability/Competence*
13. Seek advice and opinions of my co-workers/neighbors before all others. *Social Network*
14. Have a reputation for trustworthiness. *Past Experience*
15. Take initiative and assume a leadership role in problem solving. *Accountability*
16. Call a family member when I need to solve a problem. *Familial Ties*

17. Think like me. *Salient Values*

18. Are of a similar ethnicity/cultural heritage. *Similar Demography*

19. Are recognized experts in a particular area. *Expertise/Ability/Competence*

20. Sacrifice their needs for the needs of others. *Altruism*

21. Have a higher level of education and/or experience. *Expertise/Ability/Competence*

22. Are from the same organizations I belong to. *Social Network*

23. Serve as leaders in the community. *Expertise/Ability/Competence (and distant proximity within the Social Network)*

24. Possess the same personal values/ethics that I do. *Salient Values*

25. Represent the same gender as me. *Similar Demography*

APPENDIX E

HURRICANE SCENARIO SCRIPT

In the last 72 hours, meteorologists at the National Hurricane Center and emergency management personnel have been monitoring a growing tropical disturbance that has strengthened since making landfall in Cuba. With winds just below 75 mph, and a forming eye as the center of rotation, predictions are this tropical storm, named Rev, will strengthen rapidly when it hits the warm Gulf waters. Coastal residents along the Texas Gulf Coast have been warned of the potential for an evacuation order to be sent out within 24 hours. The current trajectory has the storm making landfall immediately south of Matagorda County, which places Bay City and the rest of Matagorda County on the stronger, "dirtier" side of the hurricane where the most damage is expected to occur.

Landfall is anticipated within 72 hours, and with current weather conditions, is expected reach hurricane strength in the next 24 hours, as high as Category 3. If this occurs as all the data indicates, this will be the first hurricane to hit the Texas Gulf Coast since Hurricane Ike in 2010, and will be named Hurricane Sarge. Category 3 hurricanes can lead to torrential rainfall of more than 24 inches, flash flooding in areas not normally prone to flooding, and damaging winds of approximately 100 mph.

Matagorda County Emergency Management has issued a preparedness advisory for residents to ready themselves and their families to evacuate early. The status and location of shelters, assigned evacuation routes, and a list of items to take with you are available on various websites and through the media.

After this information is released, there is a notable increase in social media activity, conversations within the community, and numerous reports. Some of the information appears to conflict with other information.

You will now be provided a set of 36 cards with pictures of people on them, their titles, and a little bit of background about them. These are all typical sources of information you may see in a disaster situation such as this. You will then sort the cards as instructed by the facilitator from the “least credible/preferred” to the “most credible/preferred”. After completing the sort, the facilitator will have a few brief questions to ask you as a part of the exit interview.

APPENDIX F

ROLE CARDS TO BE SORTED

Below is a graphic representation of what the role cards sorted in the second sort will look like. What is provided is a sample of the front and a sample of the back. Underneath the example is a complete list of roles to be included in the set. These roles, as stated in the 2.2 Study Design section of this proposal were pulled from recent emergency management literature. The citations are included in the Literature Review.

Police Officer

Age: 46

Gender: Male

Ethnicity: African-American

Experience: 24 years on the local police force

Responsibilities in an Emergency: Maintain law and order; monitor/ prevent criminal activity; assist with traffic control before, during, and after evacuations; works to ensure safety of community citizens

Card Front Card Back

Roles Represented:

Emergency Personnel: Firefighter, EMS/Paramedic, Emergency Manager
Law Enforcement: Police Officer, County Sherriff, State Trooper
Public Health: Doctor, Public Health Practitioner, Nurse
Military: United States Army, National Guard, State Guard
Local Officials: Mayor, County Judge, City Councilperson
State Officials: Governor, Director of Emergency Mgmt, Legislator
Federal Official: President, Department of Homeland Security, Federal Emergency Management Agency
Reporter: Television Reporter Fox News, Television Reporter Local News, Television Reporter CNN
Scientist/Expert: University Researcher, Extension Specialist, Government Expert
Neighbor/Friend: Neighbor/Friend 1, Neighbor/Friend 2, Neighbor/Friend 3
Co-Worker: Co-worker 1, Co-worker 2, Co-worker 3
Family: Family Member 1, Family Member 2, Family Member 3

APPENDIX G

QUALITATIVE INTERVIEW PROTOCOL

Below are the primary questions that will be asked of each participant upon completion of the sorting exercises. The interview is semi-structured so that if a participant's response to one of the questions listed leads to additional questions to explore a topic further, the researcher has the ability to do so. As per Institutional Review Board requirements, the ability for a participant to end the interview at any point will be reiterated before commencing the interview. All interviews will be recorded with participant permission for the purpose of transcription and analysis.

QUESTIONS:

1. Please describe an emergency situation where you had to see or rely on information from multiple sources to respond to the emergency?

2. When faced with the situation you have described, what kind of information did you want or need first? Describe any conflicting information you may have heard.

3. In that situation, what role does the person play from whom you first seek information?

4. When you received the information you were seeking, please describe the source where you found it?

5. In that situation, if there were multiple sources of information, please describe the source(s) you chose not to follow.

6. What encouraged you to accept information/advice from one source, but not the other sources?

7. When choosing an information source you trust, what matters most to you? (expertise, benevolence, honesty, inside my social network, my past experience with a person or similar persons, accountability, part of my family, shared values, similar demography)

8. In your own words, please describe what trust and trustworthiness means to you.

9. When you hear a person or an information source described as credible, what does that mean to you?

10. How would you describe a trustworthy individual (physical characteristics, personal attributes)?

11. To what extent do you validate information you are given from one source with the opinion of another source?

12. Within your social network, describe whom you consider opinion leaders and why you consider them to be so.

13. In the first sort, you selected (CHARACTERISTIC) as being a very important characteristic of trust and trustworthiness. What does that (CHARACTERISTIC) mean to you?

14. In the first sort, you selected (CHARACTERISTIC) as being the least important characteristic of trust and trustworthiness. What does that (CHARACTERISTIC) mean to you?

15. Please share any other thoughts you have on trust, trustworthiness.

16. In the second sort, you selected (ROLE) as being a very credible source of information. What makes that (ROLE) credible to you?

17. In the second sort, you selected (ROLE) as being the least credible source of information. What makes that (ROLE) not credible to you?

18. Please share any other thoughts you have on the credibility of information sources and source preference in a disaster.

19. Please indicate with what gender you identify (Male, Female, Other, Decline to Answer)

20. Please indicate your age using the provided ranges: (18-29, 30-39, 40-49, 50-59, 60 and above, Decline to Answer)

21. Please indicate with what ethnicity you identify: (White, Latino, African-American, Asian, Other, Decline to Answer)

22. Please indicate your highest level of education (High School, Some College, Associate Degree, Bachelors Degree, Masters Degree, Doctoral Degree, Professional Degree, Decline to Answer)

23. Please indicate your estimated household income using the provided ranges: ($20,000-$34,999; $35,000-$49,999; $50,000-$69,999; $70,000-$99,999; $100,000 and above, Decline to Answer)